THE IRON AGE

THURSDAY, JULY 5, 1888.

Steam and Its Rivals.

Prof. Robert H. Thurston, writing in the *Forum* for May, on the various attempts which have been made to supplant steam by some other fluid for working engines, says:

A few years ago, disappointed in the hope of being allowed to make a careful and crucial trial of the best recent devices of this seductive class for the benefit of a wealthy friend, who was ready, if so advised, to "take a little stock," I had a very complete study made of the several vapors best adapted for such use, thus securing a correct scientific comparison of the possibilities, if not of the practicabilities, of the several presumptive rivals of steam as a motor. Comparing alcohol, ether, carbon-disulphide (dipulphide of carbon) and chloroform, the most promising of the available fluids, with water and its vapor, steam, it was found that, as the well-known laws of thermo-dynamics indicate, all were of precisely equal efficiency if worked in perfect engines within the same range of temperature, with no waste occurring other than that which has already been described as unavoidable. If worked, in each case, through the range of pressure familiar to us as employed in the steam engine, it was found that steam required the smallest engine to do a given amount of work. It was also the most economical, with the single exception of chloroform, which was a fraction of 1 per cent. better—quite too slight a difference to be considered, and probably much more than compensated by the greater waste by friction to be met with in the larger machine. Comparing them between the temperatures customary in the steam engine as ordinarily operated the results were essentially the same, and when studied as working fluids, with the same back pressures in all cases, substantially the same results were again found. The final conclusions were beyond doubt that the limit being taken as the admissable pressure, steam is the most efficient of all, and that all the apparent advantages claimed under exceptional conditions for either of the less familiar vapors may be secured in the steam engine by that increase of initial pressure illustrated continually in the history of that motor from the days of Watt. "None of the non-aqueous vapors will ever successfully compete with steam." Steam or water power is to-day invariably the real source of all displays of electrical energy. There is no reason so far as can be perceived at present for anticipating that it will ever become the prime mover in the sense in which that term is applied to steam or to heat motors, or to water power. Nevertheless, no one can safely assert that some coming inventor may not earn fame and fortune by conferring upon his fellows some new system of converting the energies of nature into electrical energy, and in such manner as to evade that tremendous waste which is apparently unavoidable in our present methods of utilization of the grand source of artificial power, the energy of heat motion.

Improved Tail-Rope Engine.

Through the courtesy of Messrs. I. A. Finch & Co., of Scranton, Pa., we are enabled to present in this issue engravings of their improved tail-rope engine. It is of the double cylinder reversing type, the cylinders measuring 12 inches by 20 inches, and is built in the most substantial manner, with every provision for high speed and severe duty. The links, as shown in Fig. 2, are of the solid pattern, sliding in blocks provided with gun-metal slides, and having screws and jam-nuts for adjusting and taking up lost motion. The cross-head slides, connecting rod and valve-stem boxes are of gun metal, with large wearing surfaces. The piston rods, valve stems, crank pins, crosshead pins and link pins are of steel. The main boxes are Babbitt-lined, bored and fitted thoroughly. The crank-shaft is of hammered iron, and all materials used in the construction of the engines are of the best possible quality. The bed-plates are made broad, and are strongly bracketed to receive and support the heavy stands on which rest the adjustable pedestals and boxes of the drum-shaft. This shaft is also of hammered iron, the diameter and weight depending

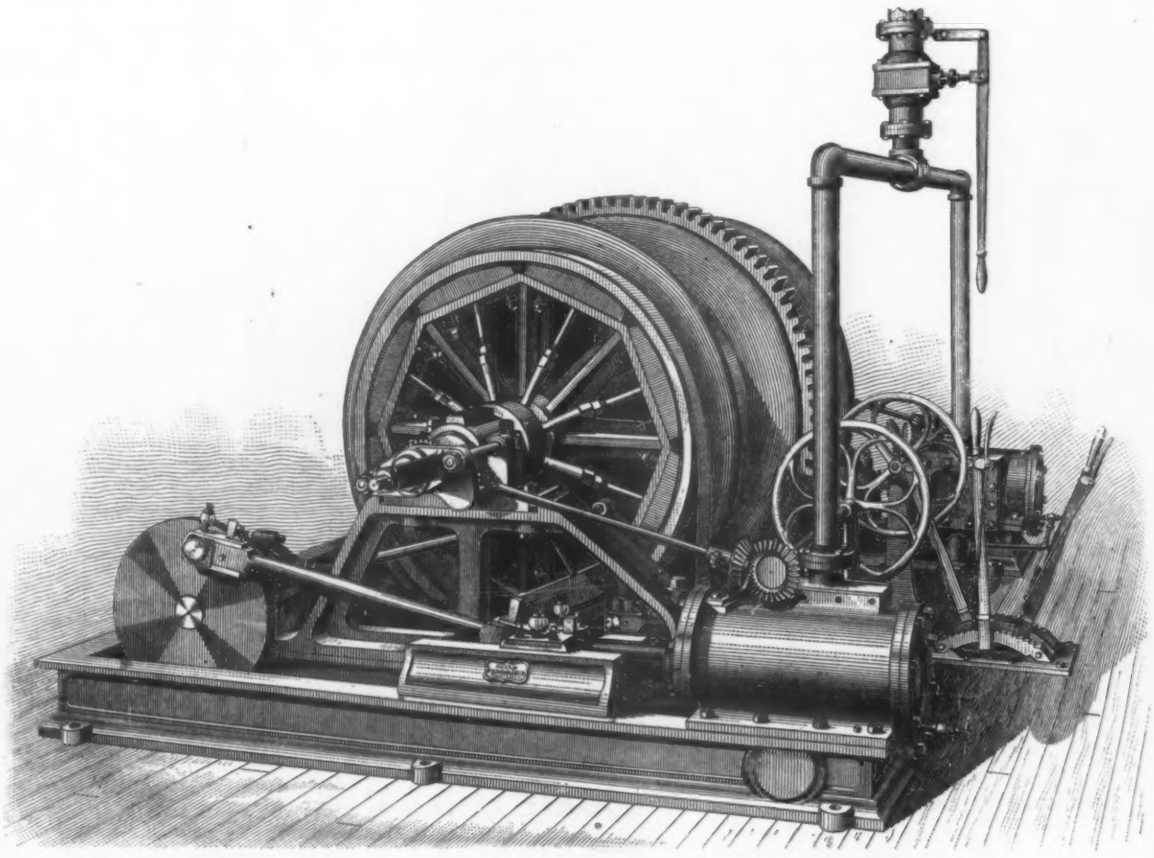


Fig. 1.—General View.

IMPROVED TAIL-ROPE ENGINE, BUILT BY MESSRS. I. A. FINCH & COMPANY, SCRANTON, PA.

on the length of shaft required for the service. On this shaft, midway between the engine, is firmly keyed a spur-wheel 6 feet in diameter. This wheel is driven by a pinion on the engine shaft, the proportions being one to four. On each side of the spur-wheel is a cast iron drum running loose on the shaft, capable of winding 6000 feet of $\frac{7}{8}$-inch steel wire rope. These drums are driven by friction clutches known in the coal regions as "umbrella frictions," a term of which the significance will become at once apparent by a glance at our engravings. These clutches are operated by screws at the ends of the shafts by means of the miter gears and shafts, which bring the hand-wheels of both drums convenient to the hands of the engineer. Fig. 3 clearly explains this. Each drum is also provided with a substantial brake, that of the left-hand drum being controlled by the right-hand lever and *vice versa*. Thus when the rope is winding in on the right-hand drum the left-hand drum, running loose, is paying out, and is under perfect control by means of the right-hand brake lever. These brake levers, as shown in Fig. 1, have latches by which they may be set at any point, giving any degree of resistance desired. The lever shown between the brake levers is the reversing lever of the engines, and is substantially the same as the reversing lever of a locomotive. In Fig. 1 the throttle-valve is shown overhead, but in situations requiring it, as sometimes inside the mines where it is expensive to take down roofs, the throttle-valve and lever may be placed below.

These engines and drums are adapted to any situations where tail-rope engines can be used. They are simple and easily managed, and are not as costly as some of the complicated machines which have been brought out for this purpose. They are built in different sizes, the largest for which patterns are completed having 16 x 24 inch cylinders. They are compact, require little room, and are powerful and efficient machines.

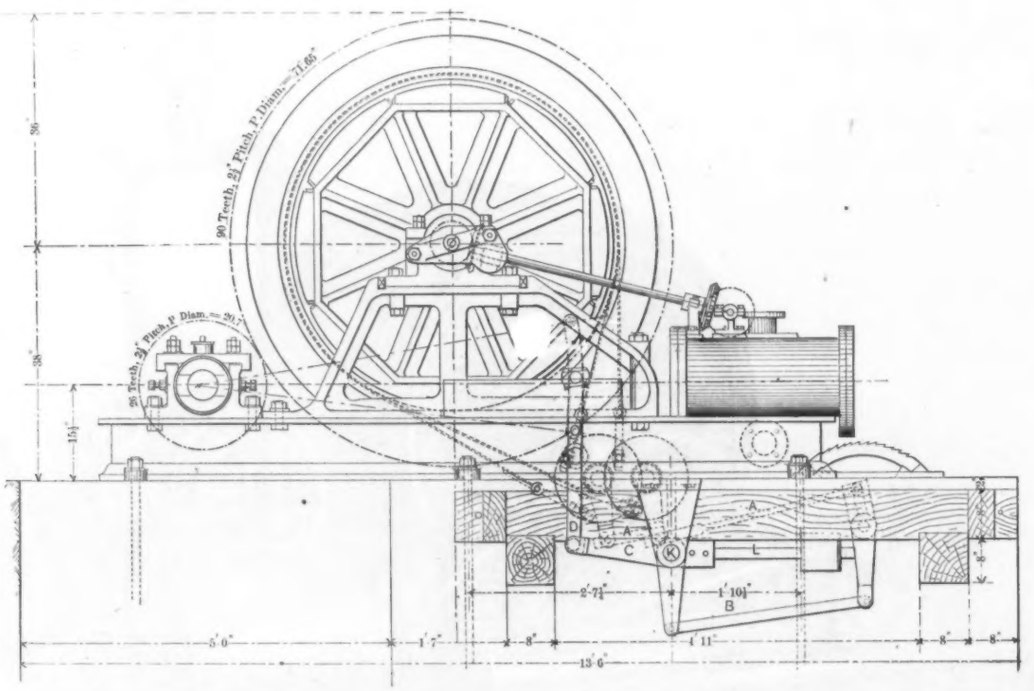


Fig. 2.—Side Elevation.

IMPROVED TAIL-ROPE ENGINE, BUILT BY MESSRS. I. A. FINCH & COMPANY, SCRANTON, PA.

Steam Navigation.

The semi-centennial of transatlantic steam navigation, dating from the first voyages of the steamships Sirius and Great Western, in 1838, gives a special propriety and pertinency to a retrospective glance in which we gather for review the records of steam navigation since the year 1813, as culled from newspapers in the United States. As best serving this purpose we take a file of *Niles' Register* and find therein a notice of the launch of the steamship Savannah, built by Wm. H. Brown, of New York, at his yard on the East River, and which earned distinction by making the pioneer voyage across the Atlantic in 1819. The experimental efforts of Fulton and Livingston have a peculiar piquancy when considered from the standpoint of the contemporary observer. And at this later day, when Buffalo, Detroit, Cleveland and Chicago are each the rendezvous of large fleets of iron steamships, and when the commerce passing through the "Soo" Canal compares favorably in point of tonnage with the entire foreign trade of the United States, it is refreshing to read of the wild antics of the savages who flocked to the banks of Lake Erie when they beheld the approach of the first steamer that wakened the solitudes with its screeches. Thus it happens that within the memory of men now living steam has gained the supremacy on all inland waters of the United States from the lakes to the Gulf, and on the ocean as well. Instead of a forest of masts encircling New York City, as in bygone years, we have only the occasional visits of mammoth iron-plated steamships as they flit to and fro between the hemispheres. Unfortunately, while Americans may glory in the achievements of Fulton, Fitch and Livingston, they have to deplore the disasters that befel the Collins line just at the critical moment when the American eagle seemed to have won in the contest with the British lion. From that reverse—in Congress refusing to grant a mail contract which would be a fair offset to the heavy subsidy received by his British competitor—we may date the decadence of the American ocean marine.

The following extracts from Niles' *Weekly Register* begin with a reference to the successes of Fulton:

May 22, 1813.—Eight, and occasionally nine, steamboats are now used at New York for the transportation of passengers and goods to and from that metropolis. Several others are building. Used as ferry-boats they have almost suspended the necessity of a bridge over the Hudson by the safety, convenience and regularity of their passage. Three go to Albany, one to Amboy, one to Tappan, one to Hoboken, one occasionally to Elizabethtown (N. J.), and one is building as a packet to New Haven, Conn., besides those for ferries.

June 4.—Letter to the editors of the *National Intelligencer*, dated Pittsburgh, April 22, 1814: This morning the steamboat Vesuvius, intended as a regular trader between New Orleans and the falls of Ohio, left Pittsburgh. A considerable freshet in the river renders it probable that notwithstanding the great size and draft of the vessel she will pass the falls without difficulty, after which she will meet with no obstruction in the rest of her passage. There is now on the stocks here just ready to be launched a boat adapted to the navigation of the Ohio above the falls which will be finished in time to meet the Vesuvius on her return from New Orleans at the falls. The boats are built by Mr. Fulton, under the agency of Messrs. Livingstone and Lathrope, for companies who have vested very large capitals in the establishment. The departure of the Vesuvius is a very important event, not only for this place but for the whole western part of the Union, and its influences will be felt over the whole of the United States. In describing it, it is necessary to use the inflated language which, unfortunately for the credit of our trade, too often renders

real facts incredible, or at least lowers their importance by the manner in which they are puffed into notice. * * *

It does not require the ornament of metaphor to impress upon the public mind the incalculable advantage of an intercourse by water effected in large vessels, which move with certainty and rapidity through an extent of internal navigation embracing a space almost as large as the whole continent of Europe, and comprising in it the productions of almost every climate. This intercourse, though now only in its infancy, must in a few years become of immense magnitude. When the late Chancellor Livingstone applied for his grant for the exclusive navigation by steam on the North River to the Legislature of New York for 30 years, on condition that he should actually accomplish it, a very sensible member of the Legislature told me that he could easily have had a grant of any further extent, as the navigation by steam was thought to be much on a footing as to practicability with the navigation by the reindeer in the Chancellor's park.

The steamboat Vesuvius went from Pittsburgh to Louisville, 767 miles, in 67 hours 25 minutes, equal to 10½ miles per hour! The city of New York is enjoying immense advantages from these vessels, as packets and ferry-boats; loaded wagons are hourly seen in that city from Long Island and New Jersey. John L. Sullivan, of Boston, has obtained a patent for the use of steam-engine power in towing luggage-boats, being a new and useful application of steam engines, and put in practice by him on Merrimac River.

July 9, 1814.—Astonishing Passage—The steamboat Vesuvius made the following passage from Pittsburgh to New Orleans: From Pittsburgh to Shippingport, 67½ hours; from Shippingport to Natchez, 125½ hours; from Natchez to New Orleans, 33 hours. Total from Pittsburgh to New Orleans, 227 hours.

April 22, 1815.—A large steamboat was about to be launched in England to run as a packet between Dover and Calais, and will no doubt do very well, as the one that plies from New York to New Haven, through the Sound, answers every expectation, even steering well by the compass, in case of fogs, notwithstanding the quantity of iron on board of her.

May 20, 1815.—The steamboat Fulton lately proceeded from New York through the Sound to Connecticut River and up that river as far as Middletown. She had a band of music on board. As the boat passed Petti Plague the musicians played the royal airs of "God Save the King" and "Rule Britannia" in compliment to the defenders of that place.

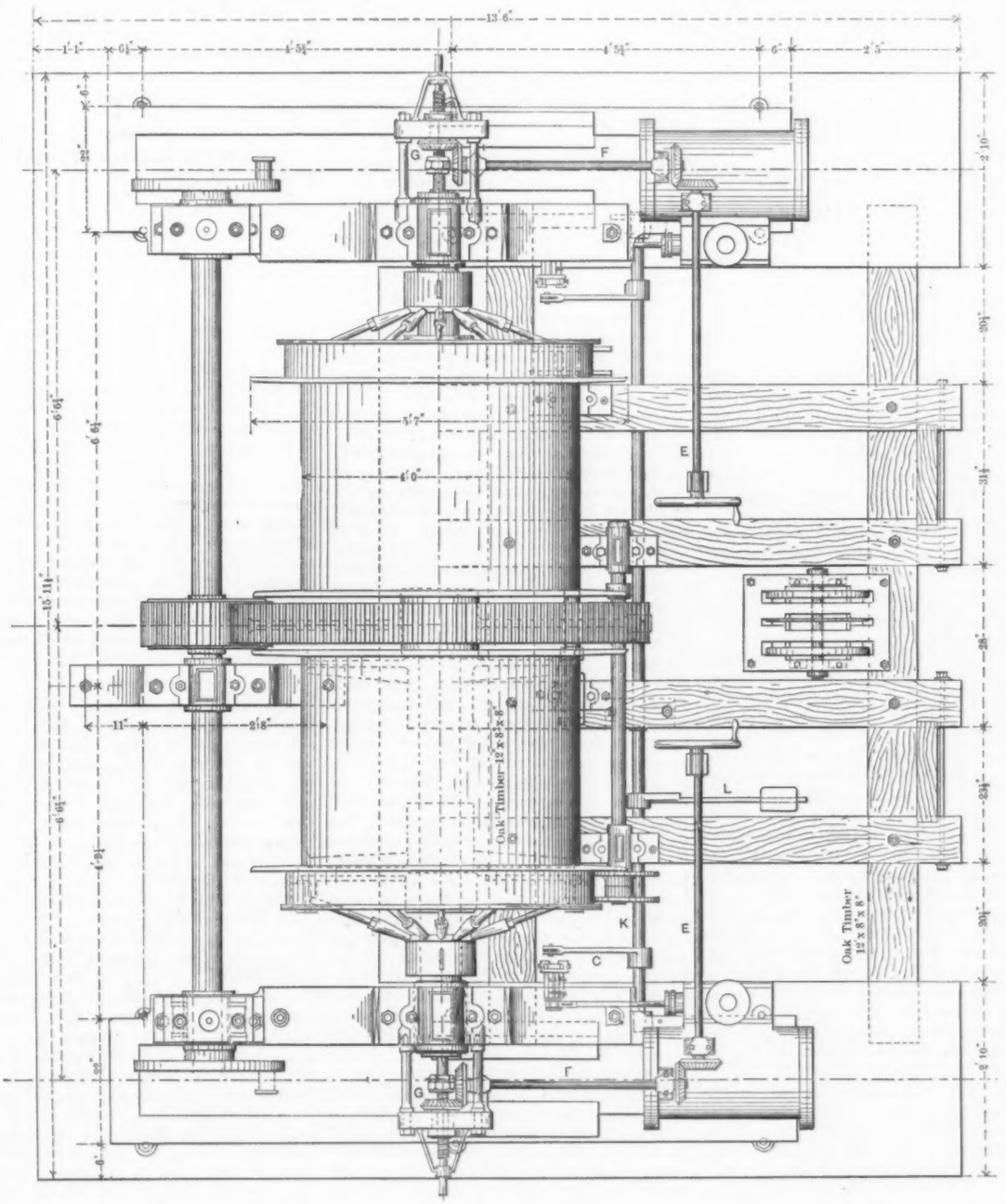


Fig. 3.—Plan.

IMPROVED TAIL-ROPE ENGINE, BUILT BY MESSRS. I. A. FINCH & COMPANY, SCRANTON, PA.

July 1, 1815.—By a letter from an officer of the steamboat Enterprise we are informed that her last trip from New Orleans to Natchez was made in four days—a distance of 313 miles—against the strong current of the Mississippi, without the aid of sails.

August 5, 1819.—Last Saturday evening the steam was first tried on the Dispatch, another steamboat lately built at Bridgeport and owned, as well as the Enterprise, by the Monongahela and Ohio Steamboat Company. We are happy to learn that she is most likely to answer the most sanguine expectations of the ingenious Mr. French, the engineer, on whose plan she is constructed. It is expected, when her works are in complete operation, she will pass through the water at the rate of nine miles an hour.

February 28, 1818.—The steamboats at New York have been successfully used in towing large and heavily laden ships into the harbor. One of them was towed against wind and tide at four miles an hour.

April 25, 1818.—Steamboats are multiplying on the Western waters. One is running between St. Louis and New Orleans.

July 11, 1818.—A steamboat of 320 tons, called "The United States," was launched at Baltimore on the 4th inst. She is the largest boat on the Chesapeake—145 feet in length and 27 wide.

August 15, 1818.—It is stated that a two-masted steamboat is nearly completed at Philadelphia to ply as a packet between that port and Havana.

August 22, 1818.—The New Orleans *Chronicle* gives us a list of 20 steamboats, carrying near 4000 tons, which trade from that port from the upper and adjacent country.

August 29, 1818.—A large steamship called the Savannah, and intended to ply between that port and Liverpool, under command of Captain Moses Rodgers, was launched at New York on the 22d inst.

September 19, 1818.—The first steamboat arrived at Kaskaskia on the ult. It was the Franklin, from New Orleans, in 18 days running. Erie, on the Lake Erie, was in like manner first visited by a steamboat on the 21st ult.

October 3, 1818.—The Erie steamboat, from Buffalo, arrived on her first trip to Detroit on the 27th August. The Detroit *Gazette* observes: "Nothing could exceed the surprise of the sons of the forest on seeing the Walking in the Water moving majestically and rapidly against a strong current, without the assistance of sails or oars. They lined the banks above Malden and expressed their astonishment by repeated shouts 'Tai-yon nichee!'"

October 17, 1818.—Inventor of steamboats, Mr. Chaumont, a naval engineer at Paris, has published a large work, entitled "The History of the Rise and Progress of Steamboats in America, England and France." In this work he tells us that Dr. Franklin, when in Paris, suggested the idea of steamboats to several of his acquaintances.

The *Register* of October 24, 1818, gives a list of 17 steamers, comprising 3642 tons, trading to New Orleans.

January 30, 1819.—The steamboat Walking in the Water is advertised to take a trip from Buffalo to Michilimackinac, to perform the entire trip in 12 days.

April 15, 1817.—The new steamboat Chancellor Livingstone, a packet between New York and Albany, is of 500 tons burthen, and cost $110,000. Her average speed is estimated at 8 miles per hour.

August 30, 1817.—Oliver Evans announces his discovery of the possibility of constructing boilers "that cannot be exploded by the elastic power of steam to any dangerous extent," the editor remarking that the "daily increasing importance of steam navigation and the weighty consequences that are depending upon it renders its safety the common concern of all the civilized world."

October 11, 1817.—A Louisville paper states that there are nine steamboats building on the waters of the Ohio and the Mississippi, which will complete the number of 20 on those waters.

December 20, 1817.—The steamboat Massachusetts has departed from Salem "on a voyage for North Carolina on Mobile."

The *Register*, in its supplements for 1815–16, copies from a report to a committee of the British House of Commons by the engineer of a steamboat called the Thames, 72 tons, arrived at London from Glasgow, the object of the trip being to ascertain the most "expeditious and the safest mode of conveying the mail to Dublin," as follows: "This voyage demonstrated that steam engines are applied to propel vessels at sea in all kinds of weather; that they have the peculiar advantage of going against winds and tides and in a calm, when another vessel could not at all proceed; would go at the rate of from seven to nine knots per hour; they are more secure than vessels with sails, as they cannot be lost on a lea-shore."

The *Register*, same date, copies from the New York *Columbian* as follows: "Wonderful traveling. The steamboat Fulton, Captain Dunker, sailed from this place on Sunday morning, after 9 o'clock; arrived in Albany in 20 hours; remained there 7 hours; left there on Monday, after 12 o'clock, and got back here in 19 hours, before 7 o'clock yesterday morning, thus having performed a passage from New York to Albany, a distance of 160 miles, and back again, besides stopping at the different landings, going and coming, in 46 hours—an occurrence, we presume, never equaled in this country. The whole distance was at least 320 miles, and was run without a sail up, or any advantage whatever from the wind, in 29 hours, making a general average of 8½ miles in an hour. (The engine was stopped over 20 times on passages, 8 of which, each way, were at regular landing places, and the weight on the safety-valve averaged less than 3 pounds during the whole time, when 8 pounds would have driven the boat 9 miles an hour.) Then or even seven years ago nothing short of supernatural agency was supposed capable of effecting what we now see accomplished by the genius of Mr. Fulton. Since the invention of balloons no human contrivance has given to motion and conveyance such speed and certainty, with equal safety and comfort as the establishment of steamboats, by which a person is now carried 160 miles in one day, and brought home the next, and performs his journey in about the same time it formerly required to go to Amboy, Sandy Hook, or any distance of 20 miles and back again. So astonishing and beneficial is this truly admirable American invention.

A Fast War Ship.—One of the fastest war ships of the world is undoubtedly the torpedo aviso Greif, of the German Navy, which on her recent voyage from Kiel to Wilhelmshaven attained a speed of 23 knots an hour. The Greif was launched in 1886, and was built, of steel, at the Germania Yard at Kiel, from designs by the German Admiralty. Her displacement is 2000 tons, and her engines have an indicated horse-power of 5400. From these figures and her exceedingly fine lines, which give to the vessel the appearance of a torpedo-boat of immense size, it will be seen that speed was the chief object aimed at in her construction. The Greif, consequently, may be looked upon as one of the fastest, if not the fastest, vessel of any maritime power, if we except the Ouragan, of the French navy, and some foreign torpedo-boats built in English yards, and which beat her record. The entire space of the Greif—of which vessel the Germans may well be proud—with the exception of the space provided for crew and stores, is taken up by boilers, engines and coal bunkers. The vessel is of the class called torpedo-boat hunters, and to aid her in that service she is provided with two powerful electric search lights, two light guns of great range, and a large number of those bugbears of torpedo boats, revolver guns. The Greif has three smoke-stacks, and carries no sails, there being only two short lookout masts.

Another Submarine Tunnel Proposed.—The question of a tunnel between Sealand and Sweden, under the Sound, had not been heard of for some time till the other day the Royal Swedish Commissioners, who were examining M. Delancle's application for a concession, sent in their report to the Swedish Government. This exhaustive document winds up with the conclusion that a submarine railway between Sealand and Sconia would no doubt insure several advantages to the international traffic, but that, as the building of it would require a very considerable capital, and the paying of the interest on the cost for a long series of years would necessitate heavy subventions from both the Danish and the Swedish Governments, in addition to the profits of the traffic, which would be inadequate for this purpose, the proposal for this new way of communication be abandoned for the present; that should ever, under altered circumstances, the want or the desirability of a submarine railway come into prominence, it ought to be built on accouut of the State.

Shipbuilding on the Delaware.—The shipbuilding yards on the Delaware are crowded with work. At John Roach's yard at Chester is the mammoth sound boat Puritan, which will cost $1,500,000, two gunboats for the United States Government, two steamships for the Ocean Steamship Company, of Savannah, and a steam yacht. Cramp's yard is full. The latest contract closed is one with Cramp & Sons by Boulton, Bliss & Dallett, New York coffee importers, for an iron passenger steamship for the Red D Steamship Line, to run between New York and Venezuelian ports. The new craft will be 264 feet long, 35 feet beam and 20½ feet depth of hold, with triple expansion engines and steam steering gear. The vessel will cost about $200,000. Government work on the new cruisers recently contracted for by the Cramps will amount to over $6,000,000. Several yards have been compelled to double their working capacity, owing to the large contracts recently entered into. Cramp & Sons have the cruisers Newark, at $1,248,000; the Baltimore, at $1,325,000; the Philadelphia, at $1,350,000; the gunboat Yorktown, at $455,000, and the dynamite cruiser Vesuvius, at $250,000. In the merchant line they have a Clyde steamship for the New York and Jacksonville trade, to cost $225,000; a Morgan liner in place of the lost steamship Eureka, to cost $250,000, and a steamship for the South American passenger and coffee trade, to cost over $225,000. In addition the firm have a lot of miscellaneous work in the building of engines and boilers for hulls built elsewhere. President Elijah Smith, of the Oregon Railway and Navigation Company, is having built at Neafie & Levy's works a large iron steamship for the Pacific Coast trade to cost over $175,000. A number of iron tugs and steam yachts are being constructed at the same yard.

The Duty on Wire Rods.*

I am the bearer of a petition which I have the honor to present herewith, relating to the question of a reduction or any change in the existing duties on wire rods. The petitioners received only very brief notice that a hearing would be granted to parties interested in this industry, otherwise the petition would have been more complete and would have borne a greater number of names.

I not only represent the manufacturers and citizens of Joliet, who signed the petition, but I also represent the Joliet Steel Company, manufacturers of Bessemer steel, who are now building a wire-rod mill capable of producing 25,000 to 30,000 tons per annum, all of which will be for sale upon the general market, as the company are not manufacturers of finished wire.

Permit me briefly to review the position of this industry:

The United States consumes about 350,000 tons of wire rods per year, requiring about 420,000 tons of pig iron or 675,000 tons of iron ore to produce them.

Under the existing tariff laws, permitting the anomaly of a more expensive, smaller-sized wire rod—namely, No. 6—to be imported at a lower rate of duty than the larger size, No. 5, the industry of manufacturing wire rods in the United States has been retarded, and about one-third of the amount required by this country is annually imported. This would not be the case if the duty was adjusted equitably to the cost of manufacture, and, in that event, the people of the United States would be benefited by the raising of the additional iron ore, coal, limestone, &c., required to make the pig iron and by the conversion of the pig iron into the steel necessary to manufacture the home rods to supplant the imported. Reducing the matter to a merely local issue, can it be denied that the town of Joliet, and the surrounding country which supplies it with the necessaries of life, would be better off if we had more diversified steel industries, instead of being limited, as we are at present, almost exclusively to the manufacture of steel rails? It is well known that railroad building in the United States fluctuates very widely. hence in some years our mills lie partly idle and our men must submit to enforced idleness if we make nothing but rails. Such has been the case this year, when, in spite of reductions in the cost of raw material and labor, we have been unable to compete with the existing low price of foreign rails imported into California under the present tariff. Twenty thousand tons of foreign rails have already entered California this year, thereby taking the place of the product of a large American mill for one month, throwing out of employment for that period not less than 2000 men directly employed in the steel industry, exclusive of all those indirectly engaged in mining iron ore, coal, &c.

It has been our purpose for some years past to add other branches to our business, and only the uncertainty of tariff legislation and the low price of imported rods debarred us from undertaking the manufacture of wire rods at an earlier date.

What is the so-called "raw material" of the rod manufacturer—billets or small blooms? Can he procure them in this country at a price to enable him to compete with foreign manufacturers of steel wire rods? Emphatically, no! for the reason that it is impossible for a manufacturer at the present stage of development and at the present rates for labor in this country to transport the varied materials required in the manufacture of steel to any given point and there produce a bloom or billet as cheaply as they can be produced abroad. The wire-rod manufacturer, therefore, pays for his raw material a much higher price than his foreign rival, and the necessary waste incurred in the manufacture of the finished product costs the wire-rod manufacturer the high price of the initial process (namely, billets), and, in addition, he has to pay very much higher wages in the rod mill than those paid by the German or English manufacturer.

It may be said that American ingenuity and the greater productive capacity of the American workmen counteract the drawbacks that I have named, but I can assure you that it is only the developments of American mechanical ingenuity in the processes of our rod mills and the cheapening of the costs of manufacturing steel in recent years that have made it possible to successfully embark in the manufacture of rods under the present rates of duty; at no lower rate of duty would the business be possible.

It has been claimed by wire manufacturers who have no rod mill of their own that they are at a disadvantage in comparison with wire manufacturers who make their own rods. It might with equal propriety be claimed that the rod manufacturers who do not convert and roll their own steel are unable fairly to compete with those who do. This argument might even be carried back to the ownership of a blast furnace and an iron-ore mine. Is that, however, a sufficient plea for handing over the market of the United States to the foreigner? Would the wire manufacturers have any good reason to expect that if our rod mills be closed or no further extensions be made, that the German manufacturer, having the market of the United States at his command, would reduce his price, or even continue to sell at the existing rates? If history is of any value, such an expectation is undoubtedly a snare. What is it save home competition that has reduced the selling price of iron and steel rails, sheet steel, nails and merchant steel of all kinds below prices ever touched before in this country?

It has also been claimed by interested parties—namely, importers or agents of foreign firms, that basic steel rods No. 6 are necessary to the well-being of American wire manufacturers and cannot be produced in this country. It would seem to be sufficient reply to this argument that upward of 200,000 tons of Bessemer steel wire rods have been successfully produced and made into wire in the year 1887 in the United States without any complaint arising as to the quality of the article manufactured.

It is not necessary for me to trouble you with tables of comparative wages paid here and abroad, because I believe it to be an already admitted fact that the compensation for labor in this country is from two to five times greater than in Europe, thanks to the beneficent results of protection which has fostered our magnificent and varied system of industries.

I respectfully urge, therefore, that you maintain a protective tariff sufficient to compensate the manufacturer for the disadvantages under which he presently labors, enabling him to continue paying the present favorable rates of wages, and also to permit the transportation companies to pay the men employed by them handsomely as they do now in comparison with the wages earned by their fellow workers abroad in transporting the mineral and manufactured products of foreign countries.

*Argument by W. R. Stirling, presented before the Finance Committee of the Senate, June 18, 1888.

One of the attractions of the Brussels exhibition is a circular undulating railway, after the well-known type of the switchback railway.

Cost of Electric Street Cars.

The Fourth Avenue Street Car Company, notwithstanding the adverse vote by the Common Council, have decided to run their cars from Fourteenth street up to Harlem by their new device, the electric motor. Before deciding upon the change, however, the directors appointed experts to make calculations as to the ratio of cost, gain and loss in the three methods of propelling street cars. The following is the result:

	Electric.	Horse.	Cable.
Cost of cars	1	0.54	0.81
Motive power	1	1.45	1.06
Construction of roadway	1	0.53	2.09
Depreciation and repairs	1	1.47	2.04
Operating expenses (including wages)	1	3.38	1.71
Totals	5	7.37	7.74
Average	1	1.47	1.55

There are now 60 electric street railways in the United States. The question is no longer concerning the success of the electric motor, but what kind of motor should be used—whether it shall be by continuous current or the storage batteries. The Fourth Avenue Company have selected the storage batteries and separate motors. A depot will be erected midway on the line of railway where the batteries can be recharged when necessary. It is expected that one set of batteries, eight on either side of the car, will run for two consecutive trips. Since the action of the aldermen, it is stated that the board, feeling the weight of public sentiment too strong against them, are disposed to reconsider their action.

Prices of Rare Alloys.—P. W. L. Biermann, of Hanover, Germany, who makes a specialty of the manufacture of metal alloys, has sent us the following quotations: F.o.b. Hamburg and Bremen, net cash: Aluminium metal, in lots of 100 kg., 49 marks per kg.; aluminium brass, 300 marks per 100 kg.; 2½ per cent. aluminium bronze, 300 marks; 5 per cent. aluminium bronze, 400 marks; 7½ per cent. aluminium bronze, 560 marks, and 10 per cent. aluminium bronze, 670 marks per 100 kg. He quotes 5 per cent. ferro-aluminium, 550 marks, and 10 per cent ferro-aluminium, 650 marks; 1½ silicon bronze, 300 marks, and silicon-bronze for conductor wire, 260 marks; 3 per cent. silicon copper, 550 marks, and silicon copper, running from 3 to 4 per cent., 650 marks. manganese copper, 30 per cent., is quoted 475 marks, while 4 per cent. manganese bronze, rolled, is offered at 250 marks, and 15 per cent. pure manganese bronze is quoted 290 marks. Metallic cadmium sells at 620 marks; phosphor-copper of 10 per cent. is quoted 320 marks, and for 15 cent. material 450 marks, while phosphor-bronze sells at 190 marks. Nickel bronze, No. 200, is quoted 180 marks per 100 kg.; Wolfram metal, 94 to 98 pure, 400 marks; chromium, 1200 marks, and Rose's metal, melting at 195° celcius, 1500 marks, and Wood's metal, melting at 173° celcius, 1600 marks. A number of different alloys for brasses and Babbitt metal are also quoted, which are, however, of less interest than those named.

Among the labor organizations of the country is the International Brotherhood of Boiler Makers and Iron Ship Builders' and Helpers' Protective and Benevolent Union of the United States and Canada. The annual session of this body was held in Chicago recently. The following officers were elected: Thomas J. Curran, New York, president; Vaughn Morgan, San Francisco, vice-president; Charles Keiffer, Reading, Pa., treasurer, Philip Starkey, Chicago, secretary. The union adjourned to meet in New York in June, 1889.

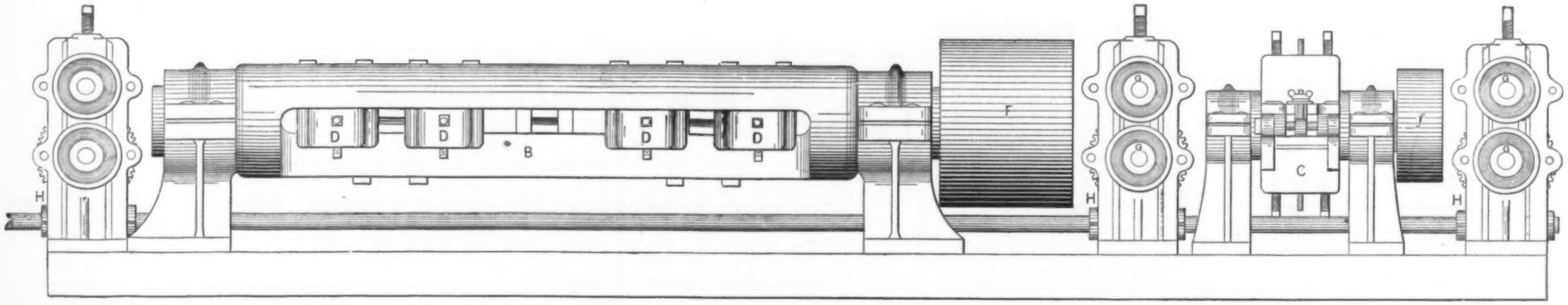


Fig. 1.—Front Elevation.

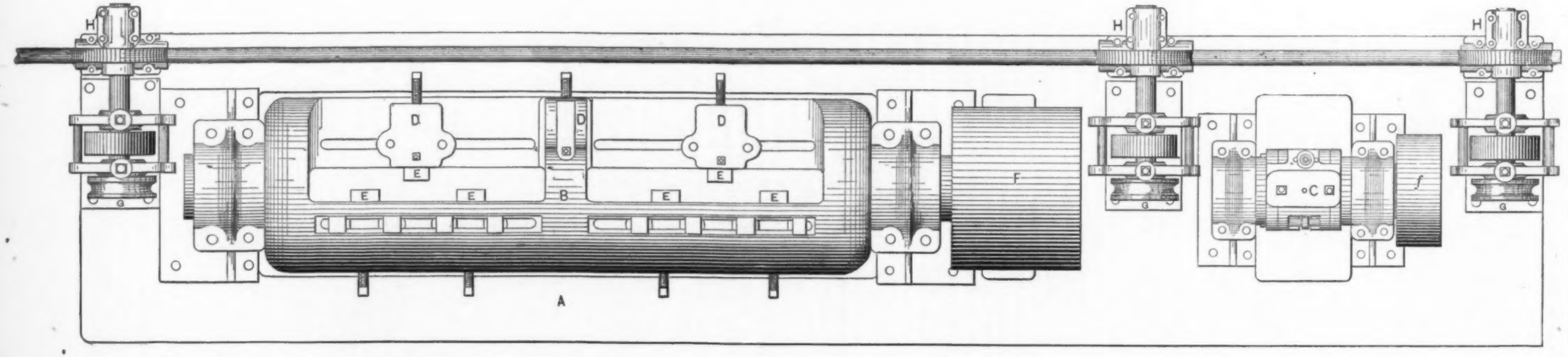


Fig. 2.—Plan.

ROTARY SHAFT STRAIGHTENING AND POLISHING MACHINE, BUILT BY THE AKRON IRON COMPANY, AKRON, OHIO.

Rotary Shaft Straightening and Polishing Machine.

We present on this and the opposite pages elevation, plan and cross sections of a rotary shaft straightening and polishing machine, designed for 4-inch shafting, and recently built by the Akron Iron Company, of Akron, Ohio, for use in their works. They now employ three machines of this kind, the smallest in use straightening and polishing on an average per day 3000 feet of shafting of from ½ inch to 1 inch in diameter. The part of the machine which straightens the shafting and which is termed a "flyer," B, is formed with hollow journals and is rotated by means of the pulley F. It is further provided with straightening blocks, arranged in alternate order on opposite sides of the axis. These blocks, E, are shown more clearly in Fig. 3, from which it will be observed that they are adjustable between the side bars of the flier and the chucks D by means of set-screws. The side bars, as shown, are slotted, enabling the chucks D to be adjusted and bolted as desired. The polisher C is also formed with hollow journals, and is rotated by means of the pulley *f*. From Fig. 4 it will be seen that it consists of two hinged parts, which contain the polishing blocks, rubber cushions and metal followers. The polishing blocks are made of wood with the grain parallel to the axis of the polisher, and can be adjusted by means of nuts and screw bolts inserted in their outer ends. They are also to some extent, self-adjusting, by means of the rubber cushions just mentioned. When the hinged parts are closed the inner ends of the polishing blocks are brought to bear against the shaft to be polished. The two parts are locked by means of a hinged pin and thumb-nut, as shown in the cross section.

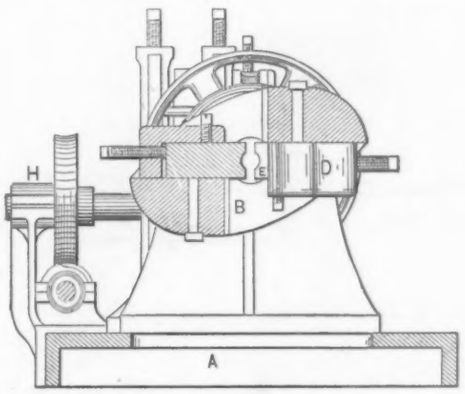


Fig. 3.—Sectional End Elevation.

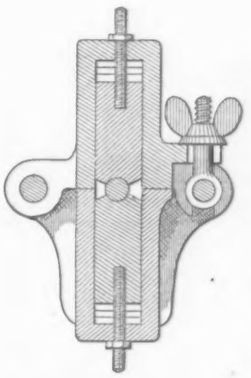


Fig. 4.—Cross Section of Polisher.

ROTARY SHAFT STRAIGHTENING AND POLISHING MACHINE.

There are three sets of friction wheels, G, which perform the offices of feed rolls, one of them being between the flyer and polisher, and the other two at the ends of the machine. They are rotated simultaneously by the gearing H, consisting of worms and worm-wheels. The shaft to be operated upon is fed in at the left, and passes out at the right. The flier and polisher are rotated independently of each other, the directions being reversed in order to lessen the tendency of the shaft to turn or twist, and the rate of speed of the former, moreover, being much higher than that of the latter. Both, however, are exactly in line. The work of the machines, we understand, is highly satisfactory.

Italian engineers, we find it stated, have made use of a new principle for the propulsion of some of their fast gunboats and torpedo catchers under construction. They have improved upon the twin screws of modern steamships by the addition of a third screw moved by a separate shaft and set of engines. The three screws are placed in the angles of a triangular pyramid. There is one on each side of the rudder, as usual, and the third is underneath, on a level with the keel-plate. It was claimed that the third screw increased the vessel's speed by fully a third, on account of the great gain in power from the deep immersion.

The Turner Steam Engine and Boiler.

Our English contemporary, *Industries*, devotes considerable space in a recent issue to illustrations and a description of a somewhat peculiar type of engine and boiler recently designed by Mr. Henry Turner, of Liverpool. The main feature of the engine is in the arrangement of the valves, by means of which the cylinders are used alternately for steam pressure, and for forcing air into the closed furnace of the boiler; and as the air is drawn round the tubes of a heater in the uptake, two objects are gained: (1) The heated air raises the temperature of the cylinder equal to or greater than that of the incoming steam; and (2) An automatic forced draft is created. In the engine which our contemporary illustrates only one pair of cylinders is shown; but it is proposed to use two, three, or more pairs as desired, each pair working on a separate crank. The high-pressure cylinder is placed on the top of the low-pressure cylinder, the two pistons being coupled and working one crank. The steam after having acted in the upstroke of the high-pressure cylinder passes to the low-pressure cylinder to act on the down stroke, thus acting only on one side of each piston, the vacuum acting only on the top side of the low-pressure piston. The boiler consists of a cylindrical shell with a tapered flue and a nest of return tubes. The crown of the fire-box has a fire-clay —or other refractory material—lining. The coal consumption claimed is less than 1 pound per indicated horse-power per hour, a figure which, we think, may be somewhat increased upon further investigation.

At the recent annual meeting of the Strong Locomotive Company a contract was signed for the erection of extensive works, with special machinery for turning out one of their improved boilers per day, the works to be completed within six months from the date of contract. With these special tools the management claim they can turn out boilers as cheap per pound as the ordinary locomotive boiler can be constructed. Progress on the new engines was reported, and two of them are expected to be on the rails ready for work within 30 days.

Saint Catherine's Lighthouse.

Referring to the recent inauguration of Saint Catherine's Point Lighthouse, on the southernmost point of the Isle of Wight, the London *Engineer* gives an interesting description of the machinery and general equipment of this important station.

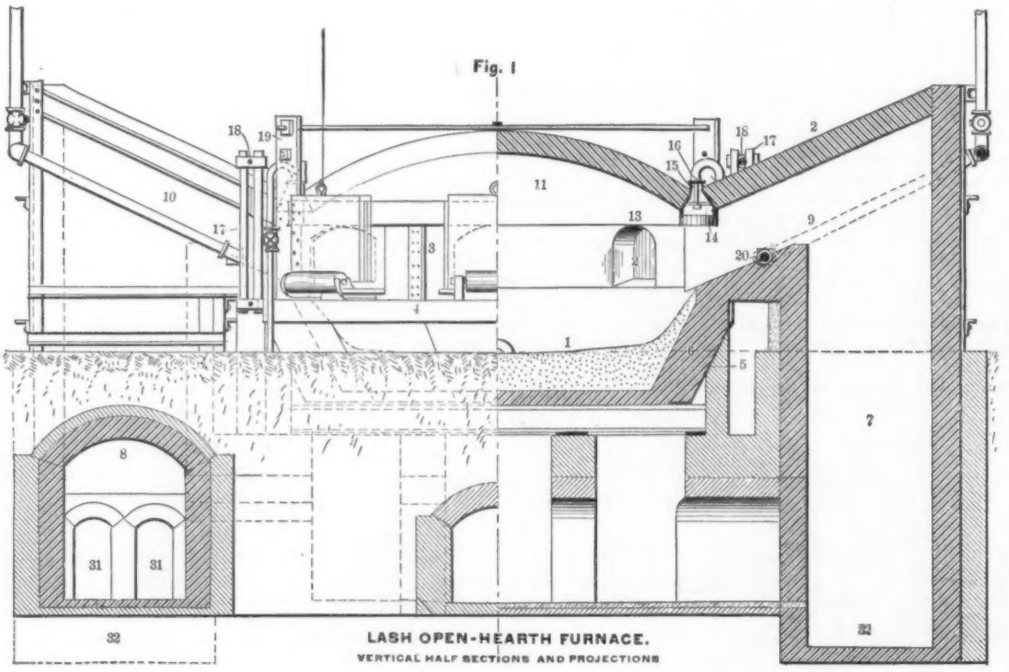
The electric light is employed, a power of 60,000 candles being obtained. Some idea of the power of this light will be conveyed to the reader when we say that the carbon pencils employed in the electric arc lamps commonly used for street lighting are about ⅜-inch thickness, while those which we are considering have a diameter of 60 mm., or nearly 2½ inches. The lamp is of the modified Serrin-Berjot type, and the carbons, which are controlled by a duplex arrangement of spring and current, are not circular in section, but fluted, a valuable improvement introduced by Sir James Douglass, whereby the centrality of the arc is greatly promoted, the carbons are kept cooler, and a better supply of air to the lamp afforded. The 16-paneled dioptric apparatus is rotated, not by clockwork as usual, but by a small vertical engine worked by compressed air from below. As the time of rotation is of the utmost importance, a most ingenious regulator or governor is applied to the little engine which controls the speed by the automatic application of a brake should the motion become too rapid. Three compound engines furnish power, two of them being designed for driving the dynamos, while the third is used for compressing air for the fog-horn. Only one dynamo and engine are used for the light, the other set being held in reserve in case of accident. The two dynamos were built by De Meritens, of Paris, and the induction arrangement of each consists of 60 permanent magnets. We may add that the Saint Catherine light is at present the most powerful electric light in the world.

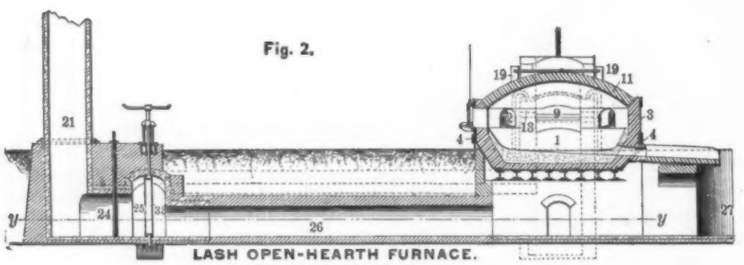
The Lubrication of Gas Engines.—Gas engines are generally lubricated too abundantly, especially if it be necessary for the attendant to leave the engine for some time without supervision, in which case he prefers to arrange for an excessive supply of oil rather than run the risk of a break down, owing to insufficient lubrication. In consequence of this circumstance it becomes a matter of some importance to be able to use the oil which has once done service over again, and it is therefore of interest to note that a special apparatus has recently been brought out in Paris by M. E. Ducretet, of 75 Rue Claude Bernard, for filtering the oil as it comes from the cylinder. An engraving which is given of the device in one of our foreign exchanges shows the device placed around the exhaust-pipe of the engine, so that the heat of the escaping gases is utilized to raise the temperature of the oil under treatment, in this way greatly facilitating the process. The filter itself is contained within a vessel coated on the outside with some non-conducting covering, and consists of a cylindrical vessel having a loose cover, which can be screwed down by suitably arranged thumb-nuts, so as to compress more or less the filtering medium, which is generally composed of compressed cotton. Above the filtering medium is a series of perforated plates which retain the grosser impurities. The filtered oil can be drawn off at the bottom through a cup, and, we understand, has been found very satisfactory for further service. We are told that one of these filters has been in constant use in Paris for several months past with eminently satisfactory results.

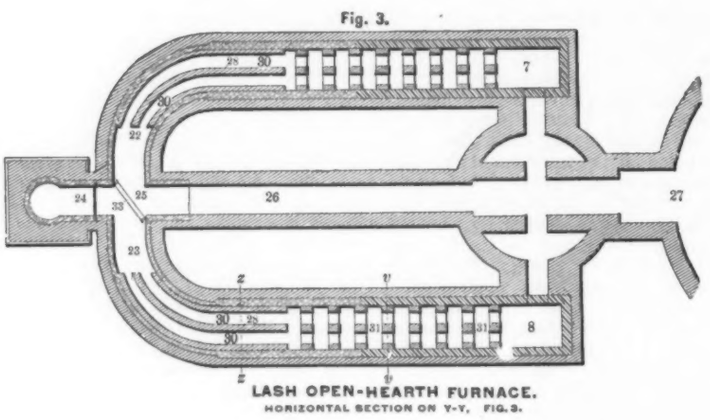
The Lash Open-Hearth Furnaces.*

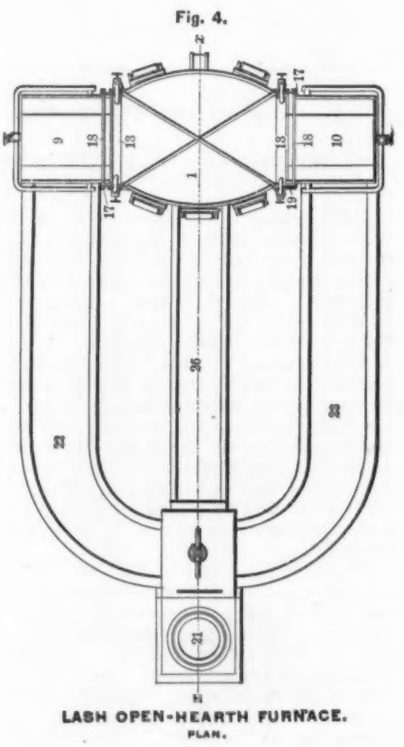
BY ALFRED E. HUNT.

One of the chief defects of the original open-hearth furnace was that a large portion of the superincumbent weight of the furnace and its charge was supported by the brick walls, between the gas and air regenerators, which were at the upper part of the regenerators, softened by being subjected often to intense heat on both sides. This fault is obviated in nearly all of the newer designed furnaces by incasing the hearth in a plate-iron shell. This shell is carried on iron beams extending completely across the furnace and resting upon exterior walls or columns which are independent of the more highly heated and perishable parts of the furnace underneath.





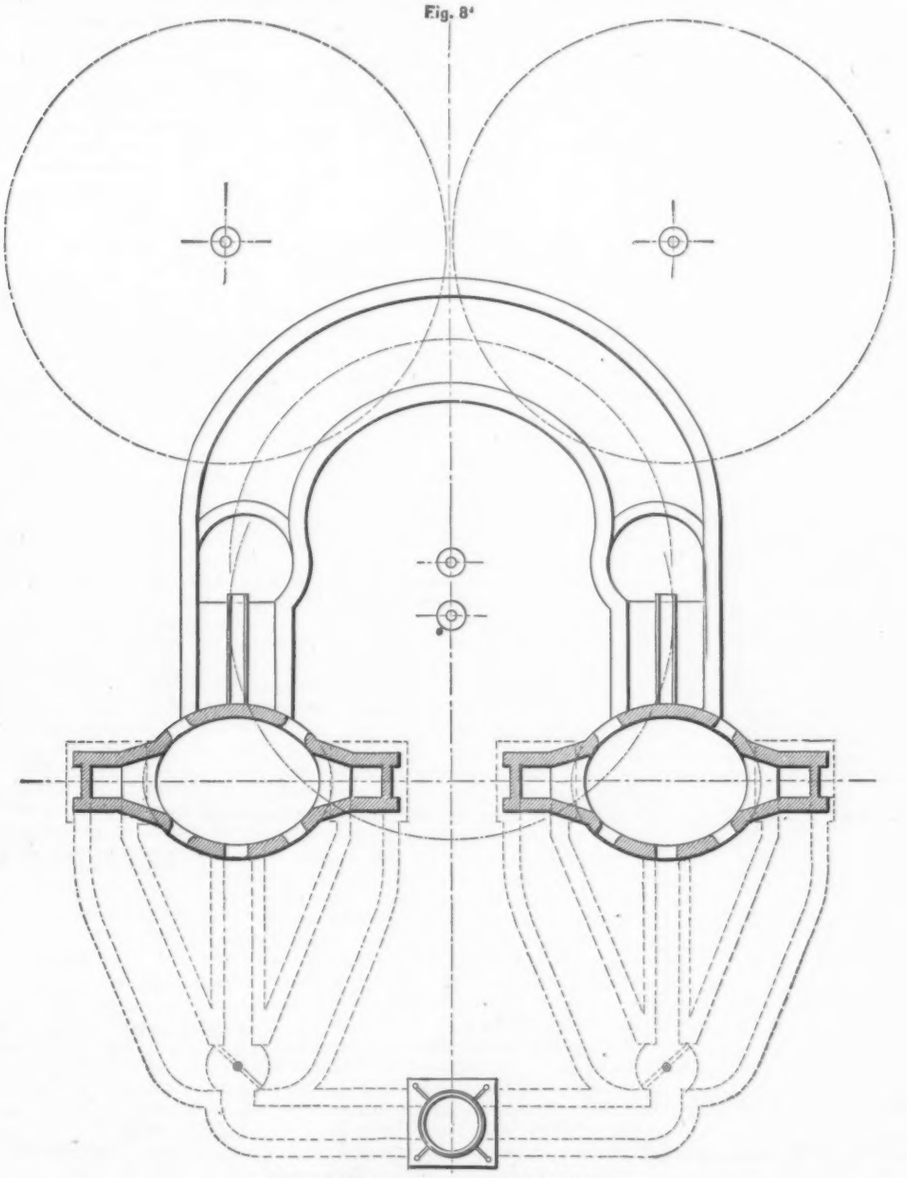




Natural gas, in the favored regions, has been a great boon to the open-hearth steel manager; he no longer has to spend a very valuable portion of his time "poking the gas man to poke his fires." The gas is carried to the furnace in an even flow through a 3-inch gas-pipe, which branches off to both ends of the furnace in 2-inch pipes. The delivery and reversing of the gas is regulated by ordinary globe gas valves placed in the circuit. The ends of the pipe are incased in the brickwork and open into the flats of each end of the furnace from the opposite side walls by leaving out the space of a header in the firebrick at the ends of the pipe. This gaseous fuel is not diluted to fully 60 per cent. of its entire bulk with inert nitrogen, as is Siemens gas, which has to be conducted in pipes of 4 feet diameter to one of the furnace gas regenerators to be preheated. Natural gas is conducted directly to the ports of the furnace, as it was found that preheating decomposed it and soon filled the checker work of the gas regenerators with deposited carbon. The use of cold gas is much more than compensated for in the heat produced by the combustion of the concentrated fuel and by avoid

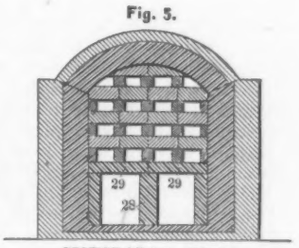
* From a paper entitled "Some Recent Improvements in Open-Hearth Steel Practice," read at the Boston meeting of the American Institute of Mining Engineers.

Fig. 8.



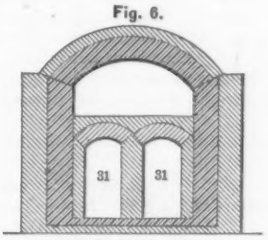
PLAN OF OPEN-HEARTH, TWO-FURNACE PLANT.

Fig. 5.



SECTION ON Z-Z. FIG. 3.

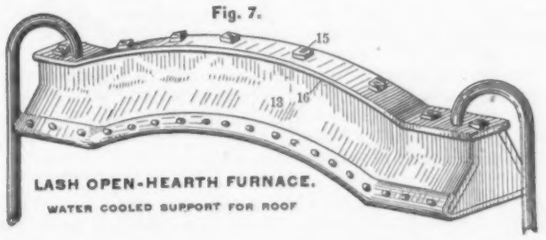
Fig. 6.



SECTION ON V-V. FIG. 3.

LASH OPEN-HEARTH FURNACE.

Fig. 7.



LASH OPEN-HEARTH FURNACE.

WATER COOLED SUPPORT FOR ROOF

ing the large amount of nitrogen which is present in Siemens gas. Natural gas melting furnaces are now built so that both of the regenerators at each end of the furnace are connected with the air inlet valve, or they are built with only one regenerator at each end of the furnace for preheating the air. In this case the air valve and air regenerators are built larger, with 60 per cent. greater capacity than when using Siemens gas. Natural gas is supplied in the service mains to melting furnaces in the vicinity of Pittsburgh with a pressure of about 8 ounces, and this pressure is adjusted in the service-pipes by regulators ordinarily furnished to the plants by the natural gas companies, and which they place with their connection to their mains at some suitable point about the plant. The pressure, as regulated by the valves at the large sized Lash furnaces, is at present only about 1 ounce or 1½ inches of water pressure as the gas goes into the melting furnace. The lighter the pressure, so long as the flow is kept uniform and steady, the better the combustion, and the more intense the heat. The steady uniform flow of natural gas has made it peculiarly applicable as a fuel for melting in open-hearth furnaces and has been a very potent cause of the growing reputation for regularity and uniformity, as well as for superiority in other ways, of the open-hearth steel made in the natural gas districts.

The tendency up to within the past year has been to increase the size and capacity of open-hearth steel furnaces, and the newer furnaces have been of 30 and 40 tons capacity instead of 5 and 7 tons as were those built at first. Except for special purposes, where large steel castings are to be made, the writer believes the limit of size has been reached. Experience with the large furnaces has led to the growing conviction at present that fur-

naces of about 15 to 20 tons at the maximum, are the most economical and produce the best steel.

The latest improved Lash open-hearth furnace plant the writer believes to be the best yet devised. It is peculiarly adapted to the use of natural gas, and there are, at the present writing, 12 furnaces now erected in Pittsburgh on the Lash system, four of 40 tons, five of 30 tons, one of 20 tons and two of 15 tons, and there are four 15-ton furnace buildings. See Figs. 1, 2, 3, 4, 5, 6 and 7, in which the parts are numbered for reference.

The hearth of the furnace (1) is made circular or, preferably, elliptical with major axis of 18 feet of hearth inside the linings and minor axis of 15 feet for a 15-ton furnace. This hearth is supported on beams resting on suitable walls or piers of such a hight that the charging-doors are accessible from the ground level. The retaining shell of ½ inch thick steel plates extends from the top of the side walls down to a broad connecting band (4) a short distance below the charging-doors; from this, the shell slopes inward to the bottom plates of the hearth. The lining of the hearth conforms to the shape of the shell, and since the bottom plates and supporting beams prevent any vertical movement downward, the conical shape of the outer walls of the lower portion of the melting chamber prevents almost all of the outward movement due to the expansion of the lining, thus preventing the rupture of the lower side-walls of the furnace.

The single flues (9) in natural gas furnaces at either end of the melting chamber are 5 feet wide and are simply large passages inclined down toward the bath at a pitch of about 4 inches to the foot, to give the flame a strong guide downward upon the metal. In order to provide a firm support for the arched roofs of the melting chamber and flues leading into it, a water-bosh, Fig. 7, made of ½-inch thick steel plate, is put in the form of a keystone in the arch of each roof, that of the melting chamber (15) and that over the downtake flues (2) butting against the plates of the inclined sides of the water-bosh, which in this way acts as a double skew-back or keystone. This bosh is 1 foot wide at the bottom and 5 feet long. It is stayed inside at proper intervals by transverse bars, and, although exposed on its under side to the intense heat of perhaps 3000° F. of the flue leading directly from the melting chamber, is found to work admirably; the writer has seen the under side of one of these water skew-backs after being in service for several months and having made over 100 heats in the furnace, which has stood perfectly, the scale being hardly detached from the surface of the metal. These water skew-backs are provided with 1-inch pipes (16) feeding water at 5 pounds pressure and leading out the waste water which is hardly lukewarm.

The side walls of the flues are held in place by suitable plates, angles and backstays (16, 17, 19) and the outer walls of the furnace are also stayed from opposite sides by means of plates reaching upward from the surrounding bands of the melting chamber and diagonal rods (18). Natural gas is led into the sloping flues by wrought-iron pipes (10–17) which enter the brickwork near the "four corners" of of the melting chamber. The gas being much lighter than the air, mixes with it in its downward rush into the furnace.

The stack (21) is placed in such a manner that the flues leading from each end of the hearth (22–23), which have checker work in them, alternately act as regenerators to preheat the air before it enters the furnace. The lower end of the stack is connected by a short flue (24) with a four-way chamber (25), to which the flues (22–23) from each end of the furnace converge and to which the air-duct (26) delivers. This air-duct (26) leads out from the ladle-pit (27) and passes directly under the hearth in this way, not only heating the air, but giving a free circulation under the hearth and preventing an excessive heating of the bottom. Along the middle of the flues (22–23) leading from the central four-way chamber (25) to the opposite ends of the furnace is placed checker-work of fire-brick supported on tiles (28), so that the bottoms of the flues are clear openings (29), giving a stronger draft; but as there is a constant tendency of the heated air to ascend there is a thoroughly uniform heating of the air entering the furnace by this arrangement.

The front portions of the flues are provided with a series of double arches, which not only serve to strengthen the side walls and tops of the flues, but also to increase the heating surfaces. The up-takes (7) are extended down below the points of entrance of the chimney flues, in this manner forming pockets (32) for the reception of any cinder, dust or other matter that may be drawn over from the furnace-chamber and preventing this material from going forward toward the stack and clogging the checker-work (31) in the chimney flues (22–23). Suitable openings are provided in the brick work, so that by taking down the brick bulkheads these cinder-pockets may be easily opened and cleaned out.

The four-way chamber (25) has the air-duct (26) leading into it permanently open, and is fitted with a three-way valve (33) alternately connecting the flues (22-23) leading to each end of the furnace with the chimney (21) and with this air-chamber (25), in this way reversing the furnace on the well-known Siemens principle. This three-way valve (33) is hollow and is kept cold by a stream of water running through it, preventing the warping or burning out of the valve, or with Siemens gas furnace, the direct loss of fuel by leakage to the chimney.

The tap-hole of the melting furnace (34) is at about the ground level, and the metal is conducted through an inclined spout (35) some 10 feet in length to the ladle-pit (27). The ladle, after been filled, is lifted by a crane and transported to an auxiliary semicircular casting pit, only about 4 feet lower than the ground-level in which the ingot molds are set. The front of the furnace is provided with three cranes, so located that they cover the entire pit space, the ladle and ladle-pit and the furnace melting-chamber, so that if a movable roof be put on the furnaces, large pieces may be swung in on to the furnace hearth.

The great advantages of the Lash furnaces are :

1. They have all the ordinary and important operations around the furnace on one ground-level, the three doors on the back side of the furnace and the two on the front or tapping side being all accessible for charging or for repairs to the furnace. A record of 500 consecutive heats, of 50,000 pounds of stock each, shows that these were charged in an average of 24 minutes per charge, 12 men, or all hands about the furnace, doing the charging from all five doors which are balanced and arranged to open by levers in the pulpit under the control of the crane boy.

2. The ladle and the tap-hole are easily accessible from the ground-level, thus avoiding all swinging platforms and stages.

3. The gas and air-flues are so arranged as to be entirely isolated from the melting chamber and hearth except where the flues enter the furnace, thus doing away with the necessity of thick brick walls which are subjected to heat on both sides; the masonry being of uniform thickness throughout much unequal expansion and bulging is prevented.

4. The chimney flues, regenerators, three-way valve and ladle-pit are all on one level, about 10 feet below the ground level, and easy of access for repairs.

5. The free access of air all around the flues and furnace-chamber prevents their being unduly heated at any time.

A Lash open-hearth plant is now being built by the Wetherell Bros. Steel Casting Company, at Thurlow, Pa., for the use of producer gas, with modifications necessary for the double sets of flues and checker-work to preheat the gaseous fuel as well as the air and double sets of ports, and the air over the gas for their entrance into the furnace. There seems to be no reason why the Lash system of furnaces, suitably modified, will not be equally advantageous for producer gas as for natural gas.

The rapidity with which repairs have been made upon Lash furnaces is one of the most important of their advantages. In two weeks' time, from heat to heat, a 30-ton furnace was repaired, the bottom taken out and the brick-work, from the ground level up, put in entirely new, with seven masons working on day turn, without any night work except in tearing out the brick-work, and in the five days making bottom and reheating.

Thirty-ton furnaces have been shut down and cooled off after the heat on Saturday, the furnace allowed to cool on Sunday, the roof and side walls torn out on Monday, the brick relaid on Tuesday and Tuesday night, gas turned on Wednesday morning, and the furnace charged, with good results, by Thursday noon. That is, a rebuilding of the lining of the entire melting chamber from the hearth up, and of the side walls of the flues leading to the down-takes, with a loss of time of only five days from heat to heat.

The Corinth Canal.—A letter from Corinth, Greece, gives a detailed account of the progress of the ship canal being constructed through the Isthmus at that point by a French company, who have received liberal concessions of land from the Government, accompanied with a proviso that there shall never be any claim for a subsidy in behalf of the constructors. The canal will measure 6300 m. from sea to sea, with a width of 40 m., and will be excavated to the depth of 8 m. below the sea level, mostly through solid rock, and the expenditure will be $6,000,000. The depth of water will be the same as in the Suez Canal. Rapid progress is making in the work, which is prosecuted by 2800 men, and is expected to take three years for its completion. The appliances include 15 engines, each drawing from 60 to 70 trucks. At the western end of the canal, on the Gulf of Corinth, are situated all the large depots and offices of the canal company. Here a new town is growing up called Isthmia. The depth of water a short distance from the shore is 30 fathoms. The sides of the canal will be solid granite, and there will be no washing away or necessity of dredging. The largest docks will be at the eastern end. The tariff of the canal will be put down to a low figure, so as to catch all the coasting trade, and it is fully expected that, in spite of the great expense of the work, it will pay well in the end.

A new gas engine, known as the Sturgeon engine, has just been brought out in England by a Manchester firm, Messrs. H. Wallwork & Co. It is a beam engine of the compression type, and of that order which works by combustion under constant volume. An impulse is received at every revolution. Illustrations explaining the construction and the functions of the different parts were published in the London *Engineer* of June 15, 1888.

The Iowa Railroad Problem.

Iowa has set the example to the other States of attempting to correct by local legislation the effect upon local jobbers and manufacturers of the operations of the Interstate Commerce act. For this reason the experience which the people of the State are acquiring in the matter of regulating railroad charges is well worthy of wide consideration. Thus far their efforts have been attended with partial failure. Notwithstanding the heavy reductions made by the Railroad Commissioners of the State, shippers are already beginning to complain of the new tariff rates, on the ground that they give no relief to jobbers and manufacturers, in that the local rates prevent doing business against Interstate rates. For instance, on fifth-class freight the manufacturer, 50 miles from Illinois, ships in material at 7 cents per 100 pounds, and ships it out to a customer 50 miles distant at the same rate. That would be $42 for the carload of 30,000 pounds. Now the Eastern manufacturer can ship the same freight to the same destination under Interstate rates for 8.4 cents per 100 pounds, or $25.20 per car, a discrimination of $16.80 per car—or, in other words, the Iowa manufacturer or jobber pays the railroad company $16 per car more than the Eastern manufacturer for the same service, except perhaps the mere switching of the car to Iowa manufacturers' warehouse. If this discrepancy runs through the several classes, the jobbers and manufacturers of Iowa have not gained much by the maximum tariff law. Their next objective point will be the Interstate Commission and the Iowa Commissioners for an adjustment of rates. The Burlington, Cedar Rapids and Northern Road, which is an all Iowa road of the B-class, has decided to go to Illinois for its coal. It has heretofore received its supply from What Cheer mines, but under the new tariff law it can go to Illinois, a much greater distance, and get it at less cost.

Mr. Ives, of the Burlington and Cedar Rapids road, has put the following conundrum to the Railroad Commission: Can a B-class road make a tariff beginning 15 cents higher (as entitled under the rule) than for an A-class road and run down to A-Class road figures after the first 100 miles? How shall figures be adjusted in making joint tariffs between roads of different classes? Can the short rates for different classes be aggregated, or shall the joint tariff represent a long haul by adding the distances and making rates accordingly? The Commissioners will be kept busy with problems of like nature for a time. So unsatisfactory to the railroad companies are the rates made by the Commissioners that they are appealing to the courts for their interference. On the 28th ult. the Commissioners were served with a temporary injunction by Judge Brewer, of the United States Circuit Court, at St. Paul, enjoining them from putting into force the new schedule of freight rates on Iowa roads. The notice requires them to appear before him at Leavenworth, Kan., July 5 and show cause why they should not be permanently enjoined from issuing such a schedule. The petitioners in this case were the Chicago and Northwestern road, the Chicago, Burlington and Quincy road and the Chicago, Milwaukee and St. Paul road. Judge Brewer gave them a hearing at St. Paul, Justice Miller, of the United States Supreme Court, also being present. The counsel for the roads say that the new schedule would ruin their business; that they have got to fight in the courts and the sooner they begin the better it will be for all concerned.

On the 29th ult. the Railroad Commissioners were served with an injunction, issued by Judge S. H. Fairall, of the District Court of Johnson County, Iowa, restraining them from promulgating the new schedule of rates. This is additional to the injunction issued by Judge Brewer of the United States Circuit Court, but is based on substantially the same ground. The petitioners in this case are the Chicago, Rock Island and Pacific Road and the Burlington, Cedar Rapids and Northern Road. Both of these companies are incorporated under the laws of Iowa, hence they seek relief through the State Courts. The principal reason given in the application for an injunction is that the proposed schedule is not a "reasonable" rate, as required by law, but is so unreasonable and severe as to cause the roads to do business at a loss if it is put in force. Comparisons of rates with those in other States are set out, showing that the Iowa rate is lower than all. It is understood that all the Iowa roads, including the trunk lines crossing the State, have agreed to pool their issues, and make a common test of the case in the courts.

NEW PUBLICATIONS.

A Manual of Steam Boilers: Their Design, Construction and Operation. By R. H. Thurston. Size 6 x 9¼ inches; 671 pages. Published by John Wiley & Sons. Price, $6.

In preparing the above work, Professor Thurston followed the double purpose of supplying a book which would, in a measure, meet the wants of the designer, builder, and the manager of steam boilers, and at the same time admit of being advantageously used as a text-book in engineering schools. On the whole, he has been eminently successful; in fact, there is, we believe, at present, no other work which is so well, if indeed at all, adapted to these ends, and student and engineer alike will find it a valuable guide and counsel. The opening chapter gives a very interesting historical account of the steam boiler, and is followed by considerations of the materials employed in its construction, their physical and chemical characteristics, methods of testing calculations of strength of different forms of boilers and allied subjects, fuels and their combustion are then taken up, and are followed very appropriately by a chapter on heat, its production, measurement and transfer. Obviously a good deal of old ground is gone over in dispensing of these subjects; still this is essential to the thorough treatment which Professor Thurston follows, and the reader will scarcely find reason to complain of the space thus taken up. What may be considered the subject matter proper, is reached in Chapter VII, entitled "The Design of the Steam Boiler." The various items involved are here taken up one after the other, and examples from practice are introduced to illustrate the proportions of different parts of boilers of several types. The design of the plain cylindrical boiler is the simplest problem of its class, and is, therefore, considered first. Then come stationary and marine single and multiflue and tubular boilers, sectional and water-tube, upright and portable, and finally locomotive boilers. The specifications which are given are necessarily brief, but cover the principal points and afford an idea of what is to be taken into account in the work. The accessories, such as the setting and chimneys, are treated of in another chapter. Following this is the construction of steam boilers. Under this head the author describes the methods and processes employed, the tools and machinery necessary and the work of construction proper. Specifications and contracts make up an interesting and instructive chapter. Sample specifications are given for a horizontal tubular boiler, a flue boiler and one of the sectional type, and two dimension specifications are added of boilers and locomotives as issued by the Pennsylvania Railway motive power department. For the benefit of boiler attendants Professor Thurston has here incorporated, also, some good advice on the care and management of boilers. Under the head of "Steam Boiler Trials," the instructions and rules governing the standard system, prepared several years ago by a committee of the American Society of Mechanical Engineers, are reprinted.

The concluding chapter is devoted to steam boiler explosions, and with some modifications was published as a separate volume last year, a review of it having appeared in our columns at the time. An appendix, containing tables relating to steam and water, is also added. The plan of the work is well arranged, and, in the main, admirably executed, and we are confident that the book will be warmly welcomed by the engineering profession.

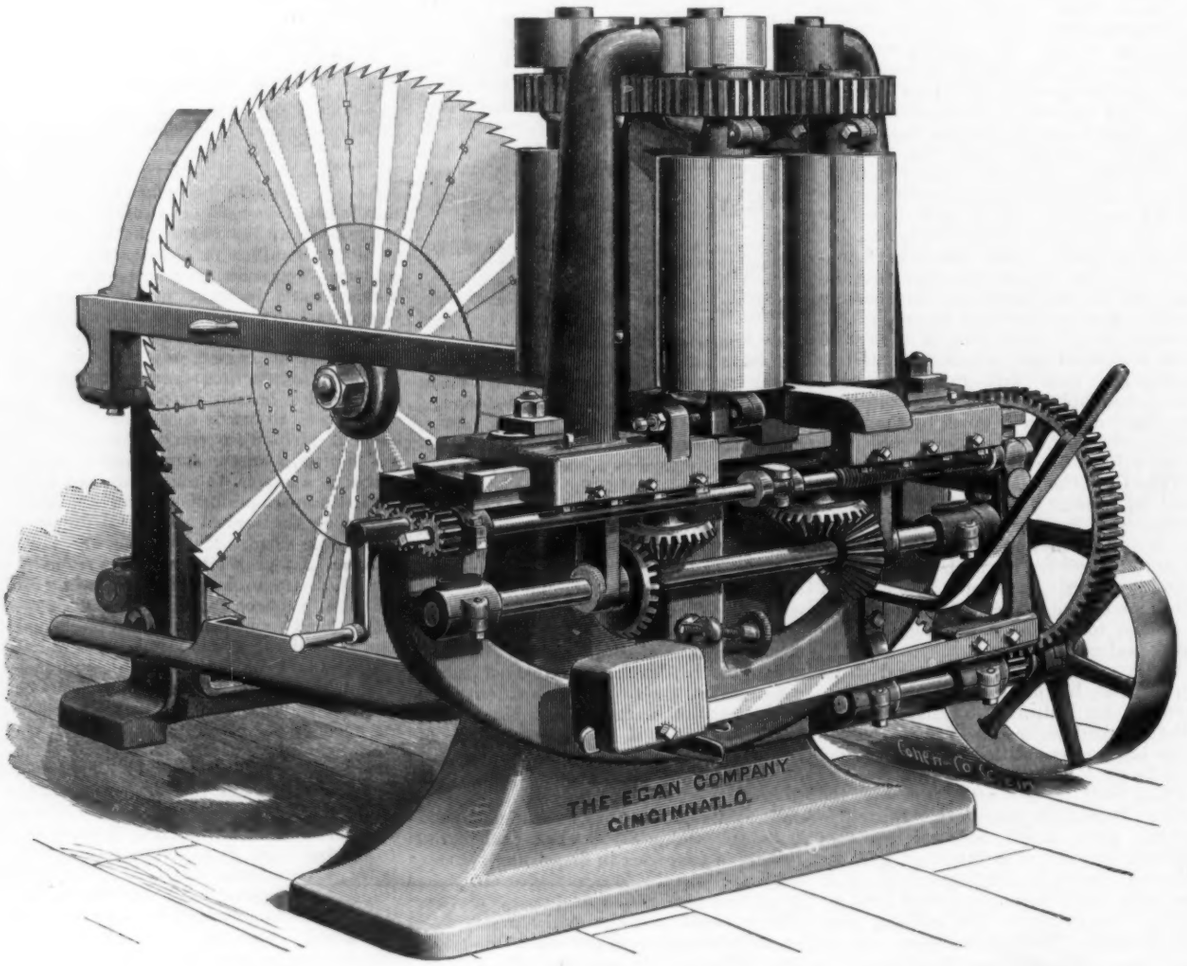
Uses of Belting. By John H. Cooper. Illustrated. Size, 6 x 9¼ inches. 399 pages. Published by Edward Meeks. Price, $3.50.

As Mr. Cooper's book has reached its third edition we need not consider it as an entire stranger, its general character being no doubt familiar to a large number of readers. The principal feature of the new issue consists in the addition of several foreign articles on belting, and extensive reference to contributions which have been made to engineering societies, the collection of practical data from different sources also having been enlarged. It may be well to briefly repeat here that the book is virtually a compilation of facts and figures, a circumstance which is apparent at a glance, the author himself having in the main performed simply the work of editing the several parts and properly classifying them. Mr. Cooper, in fact, explains that his work, arising originally from a desire to know about belting for shop use, has been that of collecting, condensing and comparing existing published data and rules. To these have been added examples of belts in use, with the object of showing how closely their performance corresponds to the rules which are given for such cases. The reader must, however, be prepared to find considerable divergencies in the results which are given by following several formula supposed to yield practically identical figures. Those who have endeavored to secure a convenient formula for belt powers and widths under known conditions by consulting different authorities have, we believe, invariably encountered these amazing discrepancies, and Mr. Cooper's book, for obvious reasons, can prove no exception. But the information which it contains is nevertheless of much value, presenting, at least, data derived from cases in practice.

English Cruisers.—Several of our English contemporaries are complaining that some of the recently designed fast cruisers for the British Navy are not at all what the name implies, having been designed for a speed of not more than 16½ knots, under forced draft. The proposed vessels, six in number, will be built of steel, and will be 230 feet long and 35 feet wide. Each will have a displacement of 1580 tons and be fitted with triple-expansion engines, estimated to develop 3000 horse-power, also under forced draft. The armament is to consist of quick-firing and machine guns, together with torpedo tubes. It is not stated whether the speed will be that developed during the official trials, or that which can be counted on in regular every-day work, but, in any event, it is interesting to note that the latest developments in the designs for the English navy will not be remarkable for the high speeds with which they are ordinarily credited.

Segment Re-sawing Machine.

We illustrate on this page a new circular re-saw with segment blades, for use where a great deal of work is wanted with the least waste in kerf. The saw is manufactured by the Egan Company, Cincinnati. It can be used to great advantage for all kinds of splitting in car works, box factories, planings mills, furniture and piano factories who desire to hold their lumber well up to size. The segment blade takes out but little kerf, is easily kept in order, and both the quantity and quality of work are all that can be desired. The frame is very heavy and substantial, and is planed perfectly true to receive the swinging feed roll frame and mandrel boxes. The feed consists of four heavily geared feeding rolls, with front top rolls for straightening wide boards. The frame which carries the feeding rolls is pivoted on the main frame in such a manner that all four rolls can be adjusted to any angle at once by loosening one hand-lock nut; the setting and angling is done by an adjusting screw to facilitate accuracy in adjusting the rolls to any desired angle. The rolls are self-centering—that is, a board 1 inch thick may be followed by one 1¼ inches thick, and both may be split in the center, or either pair of rolls on either side of the saw may be made rigid by loosening one hand nut, so that slabs of any desired thickness may be cut from a plank. The rolls come within ¼ inch of the bed plate, allowing strips ⅛ inch thick to be split if necessary, which is an advantage not possessed by many other machines. The mandrel is of the best crucible steel of large diameter, running in self-oiling boxes; the pulley on mandrel is placed between bearings, which are adjustable, and slide on planed ways to and from the feed rolls to accommodate any size saw, and to bring the teeth of the saw close up to the feed rolls.



NEW SEGMENT RE-SAWING MACHINE, BUILT BY THE EGAN COMPANY, CINCINNATI.

The New English Magazine Arm.

The following particulars connected with the proposed new magazine gun for the British army will doubtless be interesting to many. The bore is 0.303 inches diameter giving about 33 per cent. more rounds than the Martini-Henry for the same weight of ammunition. It has a detachable magazine. Experiments with the Martini-Henry, with a rifle with a fixed magazine, and also one with a detachable magazine, have shown that the last has a great advantage, arising from the circumstance that when a magazine is empty another filled magazine can be put in its place in the same time that it takes to get a cartridge out of the pouch and load with it. Thus the soldier is able to keep his attention directed almost wholly at the object at which he is firing, so long as his supply of magazines last. In a fixed magazine the advantage of rapidity is confined to the number of rounds supplied by the single magazine. When they are discharged the rifle is simply a breech-loader until a suitable opportunity arises for recharging the magazine, unless some special charging gear is applied which approaches in degree the conditions of a detachable magazine. One magazine is attached by a chain to the rifle, so as to secure its retention. Subsequent magazines may be discharged and thrown away, if necessary, in the full heat of action, for in the continued use of magazines we are contemplating a time of supreme stress and importance. The attached magazine contains eight rounds, those subsequently used six rounds each. At present the infantry soldier will carry one or two spare magazines; thus, with the first one, he is furnished with a reserve of 14 or 20 rounds for rapid discharge, according to whether he has one or two spare magazines. Cavalry and mounted infantry could carry bandoliers with eight or ten detachable magazines. Three hundred and fifty rifles are ready for the troops.

The extensive improvements which have been in progress for nearly a year in South Brooklyn, better known as Gowanus Bay, will soon convert that section into a valuable warehouse and dock property, with railway and other terminal facilities. The New York and South Brooklyn Ferry Company and the South Brooklyn Railroad and Terminal Company are virtually a single organization, all the parties concerned being united in a common interest, and by whom the extensive water front between Twenty-eighth and Thirty-ninth streets is being improved, on the line of Second avenue. The west side of this avenue will be occupied by warehouses. The expenditure in the development of this enterprise is $3,000,000 during this year alone.

THE WEEK.

Nearly all the grain storage capacity in Brooklyn has come into control of a new organization called the Brooklyn Warehouse Company, Edward Annan being president. More exactly stated, the number of stores in the combination is 134, and the aggregate capacity is 20,000,000 bushels. This result is attributed to the new elevator law, which, it is alleged, compels warehousemen to combine for common defense.

The spread of population into the annexed district above the Harlem continues with little abatement. Four lines of railway traverse the district, affording quick communication with the business portion of the city, and a line of the Suburban Rapid Transit Elevated Railroad is being pushed beyond One Hundred and Sixty-sixth street. The Manhattan Elevated Railway Company is building a grand terminal station for its east side lines near that point, between Second and Third avenues. The main line of development is along the Harlem River and the new railways, but there are broad and attractive districts between them and over eastward toward Long Island Sound about Hunt's Point, on the line of the New York, New Haven and Hartford Road and along the line of the old Boston post road, which has been widened and graded from One Hundred and Sixty-fifth street to Bronx Park. Altogether the district is capable of supporting a population of several millions, and it is growing at a promising rate.

Is the milling center moving back to the East? This question is discussed affirmatively by a writer who assumes to speak from a knowledge of the facts, representing that Minneapolis has already reached its zenith; that the building of big mills west of Chicago has ended and that Buffalo and other Eastern points have the advantage of location. He says: "The milling center has been forced too far West, and, beyond its natural and hence permanent limits by artificial means—chief of which have been lower through rates of freight the further West the miller has gone, and, next 'milling in transit,' by which the Northwest has had an advantage over the rest of the country, both in selling its flour and in buying its wheat. Hence the rapid growth of Minneapolis as the milling center of the country and of the Northwest, aided by its superior water power. But that point has now outgrown the advantages by which its supremacy was secured."

Santiago de Cuba has been placed in telegraphic communication with ports in Hayti and Venezuela.

Owing to rivalries between express and railroad companies, freight charges on merchandise shipped from Eastern points to Chicago have been cut recklessly. In some instances through-bound Western freights have been carried by express as low as 90 cents per 100 pounds to Chicago and other Western points, and many contracts, some for two and three years and even a longer period, are said to have been made for prices ranging from $1 to $1.50, and they are still in existence. Efforts are now making to come to an agreement.

The new timber raft or "ship," as the contractor insists upon calling it, will sail from Nova Scotia for New York some time during the present month. It is like a huge cigar in shape, is 600 feet long, 53 feet in breadth at the widest part, 38 feet high in the center, and draws 22 feet of water. It will contain when completed 22,000 logs, averaging 38 feet in length, 11½ inches in diameter at the butt, running to 6 inches at the top end. The whole big mass is to be bound together by 33 tons of chain, a large quantity of steel wire also being utilized. The raft is valued at $33,000.

The customs receipts at the port of Montreal for the fiscal year ending June 30 were $7,720,998, as compared with $8,874,147 the previous year, showing a decrease for this year of $1,153,149.

Three laborers were imprisoned all day in a caisson sunk 80 feet deep in the river near Council Bluffs, where a bridge to Omaha is building, and one of them was completely paralyzed. One of the doors of the air locks, through which the men pass, had become clogged with concrete, and when they attempted to return the door could not be opened. An extra door had to be built to cover the shaft before they could be released.

The Philadelphia Manual Training School held its first annual commencement exercises last week, and about 60 pupils received their diplomas. Prof. Wm. L. Sayre, the principal, presided. Superintendent MacAlister in an address, said: "What the Manual Training School means for every boy is an education broader, more comprehensive, more humane, more elevating than any heretofore offered in the history of the world. For years the world has been moving in this direction, for making education more human, more in the direction of training, and fitting boys to enter well prepared into the battle of life. It is a school which seeks to strengthen the intellectual culture of its pupils. The boy, in place of feeling with mere abstraction, with mere words, comes into contact with things, with this great, real universe in which we all live, and, therefore, his intellectual thought is most profound, his thought is more real to him."

A gigantic scheme has been proposed, by which the canons of the Rocky Mountains are to be dammed up from the Canadian boundary to Mexico, in order to form vast reservoirs of water to be used in the irrigation of arid lands, and so prevent floods in the lower Mississippi. Major Powell, director of the National Survey, estimates that at least 150,000 square miles of land might thus be reclaimed—a territory exceeding in extent one-half of the land now cultivated in the United States. The plan is to build dams across all the canons in the mountains large enough and strong enough to hold back the floods from heavy rains and melting snows, and then let the water down as it may be needed upon the land to be reclaimed.

There being some prospect of a profitable trade in the exportation of live cattle from the Hawaiian Islands, the United States revenue officers decide that cattle may be admitted for immediate slaughter without undergoing quarantine.

Three million feet of gas is the lowest estimate of the flow of natural gas every 24 hours from the well just finished at Sparta, Ill. The escape is attended by a roar that can be heard at Marissa, 10 miles away, and in the immediate vicinity the force exerted gives the earth a vibration similar to that noticeable in a factory building when the machinery is in motion. How to derive practical benefit from the well has not yet been decided.

Edison is having talks in England through his perfected phonograph "in his own familiar and unmistakable tones," although more than 3000 miles away from his auditors. He proposes to mail phonograms daily, deriving an advantage therefrom as compared with a style of writing not always legible.

The corner stone of the new United States Trust Company's building, which promises to be one of the finest of the down-town business edifices, was laid in the massive foundations at 43 and 45 Wall street, under the auspices of the building committee of the company. A large leaden box, containing coins and newspapers of current date, was plastered in the stone with appropriate ceremonies. The building is to be nine stories high, and will have a frontage on Wall street of over 50 feet. It will be of the Romanesque style of architecture, and will be principally built of a heavy rock-faced pink Massachusetts granite and Longmeadow brown-stone. The banking room of the company, on the ground floor, will be 21 feet high and trimmed throughout with marble. It will be furnished with all the modern conveniences, and a new system of ventilation invented by R. W. Gibson, the architect of the building. The estimated cost of ground and building is $1,700,000. D. H. King, Jr., is the builder. It will be ready for occupancy on May 1, 1889.

A case of alleged conspiracy on the part of employers grew out of the shoemakers' strike in Weymouth, Mass., and Judge Pratt, of the District Court in Quincy, has announced his decision. The complainant was Thos. Williams, a workman who left the shoe factory of John Carrol, on strike, after his demands for higher wages had been refused. He then entered the employment of another firm, but being discharged on account of the previous difficulty Williams sued Carrol, claiming damages for conspiracy to prevent his earning a living. It was admitted by defendant's counsel that the plaintiff was discharged in pursuance and in consequence of an agreement among the manufacturers. Judge Pratt said, in reviewing the testimony: "It seems to be the policy of our laws, and one in full consistency with the enlarged spirit and freedom of the present day, that every man has a right to determine what branch of business he will pursue, and to make his own contracts with whom he pleases, and on the best terms he can. He may refuse to deal with any man or class of men, and it is no crime for any number of persons, without an unlawful object in view, to associate themselves together and agree that they will not work for or deal with certain men, or classes of men, or work under a certain price, or without certain conditions. It seems to be well settled law that any workman, or body of workmen, may lawfully form and act as an association for the purpose of protecting themselves against the "encroachments" of their employers. Applying the same course of reasoning to the present case, it would seem more than absurd to deny to employers at least the same rights of combination to protect themselves in a situation which combined labor has forced upon them. In the case on trial I find no evidence which shows, or even tends to show, any criminal, unlawful or improper combination on the part of the defendant with any man, or body of men, within the definition of the quoted authorities, and, therefore, order judgment for defendant."

A contract has been awarded to the Philadelphia Gas Improvement Company for supplying an amount of gas not exceeding 3,000,000 cubic feet per day, at 37 cents per 1000 feet. The company submitted four processes, and that known as the Hanlon & Leadley was selected. The company are required to erect without delay a plant that will cost $275,000.

A source of wealth which Baltimore has very greatly expanded since 1880 is her manufacturing industry. In 1870 the whole State of Maryland had but 2759 manufacturing establishments, with $26,049,040 of capital, 33,182 hands, and products worth $59,219,933 in the inflated currency of that time. In 1880 Baltimore alone had 3683 establishments, with

$38,586,773 of capital, 56,338 hands, and products worth $78,517,304. Since 1880, however, Baltimore's industrial activity may be said to have taken fresh start. If there has been a loss to the city in certain branches of trade, as in coffee, sugar, cotton and tobacco, the loss has been more than made good by the gain in manufactures.

Claus Spreckels's sugar refinery now in course of construction in Philadelphia, will require 21,000,000 gallons of water a day for its refining processes, or about one-third of the daily consumption of the entire city. The filter house will measure 325 x 68 feet, and be eight stories in hight.

A gas-holder of 4,000,000 gallons capacity, the largest ever made in this country, is being built by the Continental Iron Works for the Consolidated Gas Company. Its diameter is about 190 feet, and the tank beneath is 200 feet in diameter and 40 feet high. The guides are about 80 feet high. Altogether 2500 tons of iron are consumed in the construction.

The Underground Railway Company has in prospect a protracted legal contest before it can obtain right of way in the streets. The Commissioner of Public Works insists that the company has never been duly organized, is not acting in good faith, and has not complied with the terms of its charter.

The Attorney-General of this State heard arguments on May 14 in support of petitions in which he was urged to bring suit against the Sugar Refineries Company, commonly called the Sugar Trust, and against one of the corporations absorbed by that organization. He has now decided that it is important to ascertain by judicial investigation whether the allegations set forth in the petition are true. It is stated that application will at once be made to the Supreme Court for leave to bring an action in the name of the people against the North River Sugar Refining Company. The permission of the court is not required in the case of the Trust, and for that reason it is possible for the Attorney-General to proceed against the Trust without much delay.

The arrivals of vessels at this port during June, both foreign and coastwise, were smaller than during the month of June in several previous years. British foreign arrivals number 215 out of a total of 513 and as compared with 162 American. Of the aggregate 200 were steamships

A steel freight boat was launched last week at the head of Lake Superior, for Captain McDougall, to be employed in the grain and coal trade. The captain's scheme is the very practical one of reducing insurance rates on vessel cargoes, as well as reducing the actual cost of transportation of wheat and coal on the great lakes and canals. The vessel is 187 feet in length over all, 25 feet in width and 18 feet in depth. She is flat-bottomed, tapering from the water to stem and stern. She has no machinery whatever, being simply a big steel boat. Her deck consists of nine steel hatches, guarded by a wire-rope fence.

The increase in the assessment of city real estate this year in San Francisco is $16,000,000 over that of last year, while the increase of personal property assessments is $2,500,000.

President Flores, of Ecuador, who is now visiting New York City, speaks extravagantly of the benefits to be derived by his country from the completion of the Panama Canal, which he is confident will take place not later than two years hence.

It is now fully a year since the Legislature of the State of Minnesota passed its law for the regulation of railways. This law is similar in character to the Interstate Commerce law, differing therefrom only in that it provides for a Board of Commissioners who have the power to fix rates, and to take measures to compel the railroads to accept them. The Minnesota Commissioners hold that the courts have no jurisdiction over them, and that their rates must be enforced by the roads whether the latter consider them reasonable or unreasonable. This is substantially the position now occupied by the Iowa Commission.

Denver is about to have an astronomical observatory that will rival the famous Lick observatory in California. Its dome will rise from a plain and have 1000 feet greater elevation. The building and instrument have been provided for through the liberality of W. B. Chamberlain, of Denver. The framework of the metal dome is of iron and steel, and is made as light as is consistent with a high degree of rigidity. The covering is of galvanized iron. The weight of the dome will be about 12 tons, and the devices for making it revolve easily are very ingenious; the endeavor is to substitute rolling for sliding friction. For this purpose a live-ring is employed. This consists of a number of wheels set at equal distances around a circular track; on the circumferences of these the dome rolls. The telescope, which is now being completed, will be a very valuable and expensive instrument. The diameter of the object-glass will be 20 inches and the length of the tube about 26 feet, of the best hard-rolled steel.

The formidable naval graving or dry dock, in course of construction at Esquimalt, on the Pacific Coast, under the direction of the British Government, is described by a correspondent lately visiting in British Columbia. This huge dock, now almost finished, is 450 feet long on the coping level and 430 feet long on the floor. It is 90 feet wide on top and 41 feet wide at the bottom. It is excellently constructed of hard sandstone, quarried near by, with a trauling caisson of wrought iron. Fortunately for any enemies of Great Britain on the Pacific Coast of North and South America, the dock has been finished on the basis of naval requirements of 20 years ago, and is not now large enough for the first-class vessels in the English navy. Still more fortunately for this country, it is not so large or so good a dock as the one under way in California. The contract for this Canadian dock was awarded in November, 1864, and work was begun early in the following year. It cost about $900,000, which is defrayed by the joint contributions of Great Britain and the Dominion.

One of the New York morning dailies has taken pains to collect the statistics of defalcations in the United States for a series of years, and beginning with 1878 finds that there were 34 instances of official dishonesty during that year, and that the amount of money involved was $2,784,806. Few of the offenders "met any punishment, being able in many instances to condone their offense by negotiation and the surrender of a part of their plunder." Our contemporary proposes to show the rapid growth and alarming extent of heavy defalcations by trusted individuals during the past ten years.

A correspondent at Port au Prince shows how narrowly Hayti escaped another revolution last May. Happily after a few days of martial law the leading officials in rebellion were exiled and quietness was restored. The writer says: "The principle that 'to the victors belong the spoils' reigns supreme, and is the sole issue in Haytian politics. The effect has been most disastrous. No material and consequently no moral and intellectual advance has been possible, and there is reason to believe that there has been actual retrogression until quite recent times. The magnificent sugar and coffee plantations of the French, with their systems of irrigation, have been allowed to go to ruin, and are now indistinguishable from the surrounding forests. The island is almost in a state of nature, except in the immediate neighborhood of the seaports. The exports are the spontaneous production of an amazingly fertile soil, principally dye and cabinet woods and the coffee pickings of the old plantations. All exports and imports are taxed to the extreme limit—just short of prohibition. Still, not a single article is manufactured by the Haytians. Haytian laws forbid a white man holding a title to land; nevertheless, the bulk of the mercantile business is carried on by German, French and American companies. The wealthy Haytians derive their revenues from ground rents in the cities and the spoils of office, consequently they have comparatively little to lose by revolution, which is their occupation and amusement. By the black savages of the interior a revolution is always welcomed with fierce joy. It is their opportunity to loot and burn the stores of the hated whites."

Real estate movements in New York city this spring are sluggish. Neither dealers nor builders take hold with avidity. Nevertheless, applications for new buildings are numerous in Brooklyn and New York. It is noticed that while there is much less activity in the building industries compared with one year ago, the scale of expenditure averages higher.

The Melbourne Exposition, to open August 1, will commemorate the founding of European settlements at the antipodes. The building is a grand structure 1240 feet long and 1000 feet wide, comprising, with its temporary annexes, more than 1,000,000 square feet. The area according to divisions is as follows: Space available for outside exhibits, 8½ acres; area of main buildings, machinery and temporary annexes, 23¼ acres; total area of gardens, 12 acres; Carlton gardens, 19¼ acres. Total, 63 acres.

The nucleus of the great Southern empire now has a population of close on 3,750,000. The latest statistics on the subject give the following:

New South Wales	1,044,000
Victoria	1,035,943
Queensland	359,059
South Australia	315,000
Tasmania	140,711
Western Australia	44,532
Total	2,939,245
New Zealand	645,615
Grand total	3,584,860

The principal centers of population are Melbourne and its suburbs, estimated at 400,000, Sydney, 370,000, Adelaide, 135,000, Brisbane, 55,000, Hobart, 30,000, Perth, 6000 and Wellington, New Zealand, 28,000. In addition there is Auckland and New Zealand with a population of say 50,000, and Dunedin with a somewhat smaller population.

The public benefactions of the Vanderbilt family are held up as an example to the rich people in other cities. The Club-House for railroad men, the Hospital and Nurses' Training School for women and the Mission Church, all the gift of Cornelius Vanderbilt; the Hospital for Cancer Patients, erected and endowed by Wm. K. Vanderbilt and his married sisters, and the Free Circulating Library in Greenwich avenue, built and to be supplied with books at a cost of $100,000 by George Vanderbilt, are instanced as proving that the present heads of the family are "really determined to be something more than mere millionaires."

MANUFACTURING.

Iron and Steel.

W. H. Peters, C. E. Murdock, George Peters, Jas. F. Peters and John Peters, Sr., are the incorporators of the Jackson Furnace Company, formed to operate the Huron Furnace property, at Jackson, Ohio, which they have purchased. The capital stock is $25,000. The purchase includes 235 acres of coal land, and there is a shaft mine at the furnace from which coal will be obtained without the labor of transporting it. Ore and limestone from the Lawrence Furnace lands will be used. Huron is a 25-ton hot-blast furnace, size 50 x 13 feet, which was remodeled seven or eight years ago and has been idle for some time past. The new company propose to have the furnace in blast by the 1st of August. John Peters, Sr., was made president of the company, J. F. Peters, vice-president and W. H. Peters, secretary and treasurer. The last-named gentleman will have charge of the property.

Mr. H. W. Rathbone, president of the Elmira Iron and Steel Rolling Mill Company, Elmira, N. Y., informs us, under date of June 30, that the report of a stoppage at the works, printed in our last issue, is incorrect. The mills and furnace are in full operation.

The Struthers Furnace Company of Struthers, Ohio, have secured another lease of the Struthers furnace at that place from Mr. Fayette Brown, receiver, and will probably put it in operation as soon as repairs now being made are completed, which will be some time about August 1 next.

In answer to a report that the Pine Iron Works of Joseph L. Bailey & Son, located at Pine Iron Works P. O., Pa., would close down for an idefinite period, we received the following from the firm under date of the 25th ult. "We are running about half time, but have no intention of closing down at present. Trade here is very dull, the 'tariff agitation' in Congress rendering it uncertain and consequently dull."

Mount Laurel Furnace, owned and operated by the Clymer Iron Company, of Temple, Berker County, Pa., will be blown out about the 5th inst. for repairs, which will be made during the latter part of the year. The furnace will hardly resume operations again this year.

Isabella Furnace, of Jos. D. Potts, located at Barneston P. O., Chester County, Pa., was blown out on May 27 last for repairs, which are now being pushed to completion as rapidly as possible.

The Virginia Nail and Iron Works Company, of Lynchburg, Va., under date of the 28th ult., write us as follows: "We blew in our new furnace (the Nannie B) on the 12th inst. She has been running along very nicely, making an excellent quality of pig iron from James River ores. We, of course, use coke. Dimensions are 65 feet high, 12 foot 3 inch bosh, 6 foot 6 inch hearth, with 7 foot 6 inch top; commenced work in May, 1887, on foundations, &c. We use water-power. The furnace is fitted up with two iron-pipe stoves. The gas not required for the stoves is taken to the heating and puddling furnaces of our rolling mill."

In our issue of last week we made mention of the fact that the blast furnace of the Penn Iron and Coal Company, at Canal Dover, Ala., had blown out for repairs. We have since received the following advices from the company, under date of the 27th ult.: "We blew out after a continuous campaign of 28 months. Will put in new lining and bosh complete and make considerable addition to blowing capacity. We are located in the middle of the Blackband ore district of the Tuscarawas Valley, and make a specialty of blackband foundry iron, using a larger percentage of blackband ore in our Tuscarawas pig iron than is used in any blackband brand made in the United States. We will blow in again about August 15 next.

The entire plant of the Sharon Iron Company, at Sharon, Pa., closed down on Saturday, the 30th ult., for repairs and stock taking, and will probably not resume until a settlement of the wage scale trouble takes place.

In our issue of last week we made mention of the failure of the Cartwright Iron Works, of Alikaima, Ohio. A press dispatch from Steubenville, Ohio, gives the following additional particulars of the failure: The statement of liabilities of the Cartwright Iron Works, which assigned on Wednesday evening, confirms the original estimate. They will reach $60,000. The assignee refuses to make public the names of the creditors and the amounts due them, but representatives of several Pittsburgh iron and machine firms were in the city to-day investigating affairs. It is said that the company held a large block of Graff, Bennett & Co.'s paper, upon which they could not realize. This, with the inadequate size of the plant, precipitated the failure. The company have only about $7000 personal property above the value of the plant, upon which there is a mortgage of $9000 held by the Miners' and Mechanics' Bank, of this city. This bank sold the company the plant for $12,000 originally. The assignee has issued time certificates to the employees for their wages, which they have negotiated for 50 cents on the dollar. It is now feared that the personal property will not be sold for much more than to pay the employees, to whom there is owed $3500, and the costs of assignment.

On Thursday, the 28th ult., the employees of the Linden Steel Company, Limited, of Pittsburgh, were notified that their wages would be reduced 10 per cent., to take effect on July 1. The reduction applies to all men who are not members of the Amalgamated Association. It is expected that the men will refuse to accept the proposed reduction. A meeting of the employees will be held during the present week to take action on the matter.

The entire plant of Singer, Nimick & Co., Limited, steel manufacturers, at Pittsburgh, has been closed down for an indefinite period. Some time ago the firm posted a notice of a reduction of 10 per cent. in wages, to take effect on June 1 last. This was accepted by the workmen and the works continued in operation until the next meeting of the Amalgamated Association and the Knights of Labor, which were held at Pittsburgh. The firm employs men who belong to both of the organizations, and, having a reduction of wages without the authority of the associations to which they belonged, they were threatened with expulsion if the reduction was not at once restored. The firm refused to grant this and on Wednesday, the 27th ult., the following notices were posted on various parts of the works:

Notice.—Wednesday, June 27, will be pay day instead of Saturday, June 30.

SINGER, NIMICK & CO.,
PITTSBURGH, June 27, 1888.

This is to give notice of the discharge of all our hands. Any person desiring to enter our employ hereafter may make application to Mr. F. B. Nimick, either personally or by mail.

W. H. SINGER, Chairman.

It is evidently the intention of the firm to deal with its employees individually hereafter, so as to prevent another interference from what are considered outside parties. It is expected that a majority of the employees will withdraw from labor organizations to which they belong and that the works will resume operations in a short time.

Mr. Albert Broden, of Reading, Pa., has been appointed superintendent of the furnaces of the Philadelphia and Reading Coal and Iron Company. He will have charge of some ten furnaces along the main line of the Reading Railroad and branches.

A large brick addition is being made to the galvanizing department of the National Tube Works Company, of McKeesport, Pa. The entire plant of this company was closed down on Saturday, the 30th ult., for the purpose of making repairs. As soon as these are completed part of the works, at least, will resume operations. The report published that the shut-down was for an indefinite period is untrue.

At a meeting of the directors of the Bethlehem Iron Company, held at Bethlehem, Pa., on Tuesday, the 26th ult., a local paper states that the report of the president showed a very material falling off in the output and profit. The profits during the past year were hardly sufficient to pay the interest on the funded debt and the dividends to stockholders. The following were elected directors: E. P. Wilbur, Robert H. Sayre, Sr., Robert P. Linderman, W. W. Thurston, Joseph Wharton, John Knecht and George H. Myers. W. W. Thurston was then elected president, R. P. Linderman, vice-president; Robert H. Sayre, Sr., general manager; John Fritz, general superintendent; C. O. Brunner, treasurer, and A. S. Schopp, secretary.

The Robinson-Rea Manufacturing Company, of Pittsburgh, manufacturers of rolls and rolling-mill machinery, report that they are crowded with orders for rolls and are running their works to their utmost capacity in order to keep up with the demand.

Robesonia Furnace, at Robesonia, Pa., has again gone into blast.

A new engine has recently been placed in the works of the New Castle Wire Nail Company, at New Castle, Pa., to which is attached a belt 30 inches wide and ½ inch thick. The above company have increased their capacity by an addition of ten new Nail machines, making a total of 75 nail machines now being operated by the firm.

Three new blast furnaces are to be erected near Birmingham, Ala., at a cost of $700,000. The projectors of the enterprise are H. F. De Bardeleben, of Birmingham, and men from Charleston and Savannah. Work is to be begun immediately.

Machinery.

The Joliet Steel Company, of Joliet, Ill., have ordered an electric plant, using the Waterhouse arc and incandescent system made by the Waterhouse Electric and Mfg. Company, of Hartford, Conn. The Oregon Improvement Company have also purchased a combined arc and incandescent plant of the Waterhouse system, for the purpose of lighting their wharves, machine shops and railroad depot at Seattle, Washington Territory.

The machinery for the new steel Hoboken ferry-boat Bergen will consist of a triple expansion engine with cylinders measuring 18½, 27 and 42 inches in diameter, with 24-inch stroke. C. H. Delamater & Co. are building the engines.

The Secretary of the Navy has awarded contracts for turning and boring lathes for the Washington Navy Yard as follows: For three lathes for 16-inch B. L. R. hoops, to Binnse & Housechild, of Harrison, N. J., at $45,000; for one lathe for

6-inch B. L. R., to Bement, Miles & Co., of Philadelphia, at $19,950; for five lathes for 6-inch B. L. R. hoops, to Detrick & Harvey, of Baltimore, at $15,342; and for five lathes for same to I. H. Johnson, Jr., & Co., of Philadelphia, at $23,298.

The Deane Steam Pump Company, of Holyoke, Mass., have issued a small catalogue dated April, 1888, showing a number of engravings of their different pumps and giving brief particulars.

The Pennock Bros., car builders, Minerva, Ohio, have lately added a 100,000-Howe track scale, made by the Howe Scale Company, Rutland, Vt., to their works. At the natural gas center, Findlay, Ohio, the Howe scale is largely represented, and late contracts have just been completed with the Findlay Iron and Steel Company for 100,000-pound track scale, muck-bar scale and other smaller scales; also with the Briggs Edge Tool Works, David Round Chain Works, the Wetherald Wire Nail Company and David Kirk. Large Hopper scales were last week put in at Pompei, Mich.

A very interesting catalogue has just been sent us by the Thomson Electric Welding Company, of Lynn, Mass., referring at some length to their process of electrically welding different kinds of metal, and containing engravings of the machinery employed. The assured practical value of the process makes a perusal of their pamphlet desirable.

The Philadelphia and Reading Railroad Company have received from the Baldwin Locomotive Works six of the largest locomotives in the country. They are intended for the Frackville branch, and will weigh 75 tons or 168,900 pounds each. They will have the wagon-top boilers.

The Westinghouse Machine Company, of Pittsburgh, are building six large engines for shipment to Rome, Italy.

The partnership heretofore existing between S. H. Campbell and W. J. Boston, in the Cloud Foundry Company, of Allegheny City, Pa., was dissolved on the 26th ult. by the retirement of W. J. Boston. The business will be continued by the remaining partner.

At the annual election of the Heine Safety Boiler Company, of St. Louis, held on Saturday, the 16th ult., the following gentlemen were elected to constitute the board of directors for the ensuing year: E. D. Meier, Robert W. Hunt, Fred Suessdorf, Theo. G. Meier, Chas. F. Foster.

Messrs. Howard & Morse, 45 Fulton street, New York, have issued a circular, dated June 5, in which they direct attention to the fact that they have commenced suits against manufacturers and users of ventilating wheels infringing their patent for the Blackman air propellor.

Hardware.

The Rockford Bit Company, Rockford, Ill., are about to remove to Kokomo, Ind.

Cincinnati Wire Company, Cincinnati, Ohio, are at present shut down for repairs, but expect to resume the running of their mill in about a week.

E. C. Atkins & Co., Indianapolis, Ind., since the introduction of natural gas, which is being conveyed from a distance of 30 miles north of the city, have been using the fuel in all departments of their saw manufactory with excellent success, particularly in the tempering department, the furnaces in which have been entirely remodeled after designs patented by them. The change enables the company to produce a much more uniform temper and even flat surfaces for their blades.

Miscellaneous.

Among recently authorized corporations in Illinois are the following: The Empire Mfg. Company, of Rock Falls, to operate in agricultural implements and barb wire; capital, $50,000; incorporators, John J. A. Zeller, L. E. Phelps, R. K. Swift and C. W. Parker. The Hydro-Pneumatic Mfg. Co., of Chicago, capital, $100,000; to manufacture pneumatic and hydraulic apparatus; incorporators, J. W. Powers, F. Benoit, F. M. Weller, J. S. Hunt and J. B. Edwards. The Benjamin Machine Company, of Chicago, capital, $50,000; for the manufacture of woodworking and other kinds of machinery; incorporators, R. B. Sample, H. M. Graham and R. W. Morrison. The Chicago and Calumet Rolling Mill Company; to manufacture, buy and sell iron and steel and the products thereof; capital, $500,000; incorporators, John L. Pfau, Warren F. Pitney and Edward C. Starr.

A heavy vein of natural gas is reported to have been struck on the 27th ult. on the farm of Henry Marshall, in St. Louis County, 12 miles west of St. Louis. The gas was encountered at a depth of 1200 feet, and a flame 35 feet high is burning at the mouth of the bore. A company has been organized to pipe gas to St. Louis from Sparta, Ill.

About 250 brass workers, who for seven weeks were on a strike in two of the principal brass works of Cincinnati, declared the strike off on the 28th ult. The shops concerned in the strike are now free shops.

The Heine Safety Boiler Company have an order for two 85 horse-power boilers for the water works at Jefferson City, Mo.

The Worthington Hydraulic Works have sent two large pumps to the Missouri Pacific Railroad Company's coal mines at Rich Hill, Mo.

On Saturday, the 30th ult., the Northwestern Mining Company, of Brockwayville, Pa., gave notice of a 10 per cent. reduction in the wages of all miners and laborers, to take effect July 1. The company employ 1500 men.

Electric Motors for Naval Use.

Lieut. B. A. Fiske, writing in the *U. S. Army and Navy Journal* on "Motors for Naval and Military Use," says:

Three years ago the ability of electric motors to train guns was shown to the authorities in England, and since that time much progress has been made in perfecting the apparatus for applying electric motors to this kind of work. Little difficulty has been experienced, for though there is nothing that requires such accurate and rapid handling as a great gun in a seaway, there is no other engine capable of such accurate and rapid work as an electric motor, and its advantages over steam, hydraulic and pneumatic engines are so marked that it would be idle to compare them. The indications now are that we shall have at least one gun in the Chicago trained by electricity.

But it is not in the training of the guns alone that motors can be advantageously employed; they can also be used in elevating. In the Atlanta, when rolling from 10° to 20° each side, and from 10 to 12 times per minute, the line of sight of the guns sweeps past the horizon so fast, even near the end of a roll, as to require from the gun-captain a rare degree of skill if we would have him shoot as accurately as such fine guns should be shot. The trouble is that the gun is beyond his control except in the matter of training, because the most that he can do is to wait for a favorable time of roll and catch the line of sight on the target as best he can. To use the gun effectively he needs some arrangement by which he can put the gun on the target and keep it there, independently of the rolling of the ship. He needs some arrangement like the shoulder piece of the Hotchkiss guns, by means of which experiments on this ship have shown a very little practice enables a man to keep the line of sight almost exactly on the horizon or on any other object.

Electricity puts this power directly into the hand of the gun captain, for by means of a small electric motor on the elevating gear and a suitable switch he can raise, or lower, or stop the gun by simply moving his hand. The gun captain being able to train the gun to the right or the left, and to raise it up or down, the only thing left to do is to give him an electric primer, fired by means of an ordinary "push button," so that he can fire the gun quickly when the sights come on, instead of losing time by hauling on a lock lanyard. The advantage of this quick means of firing by using the electric primer stands out clear when we recollect that in a ship, say the Atlanta, which rolls in a seaway about 3° per second on the average, an error on the part of the gun captain of only $\frac{1}{10}$ of a second of time means a vertical error, on a target a sea mile distant, of about 31 feet. This remark applies, of course, only to the individual firing, and not to broadside firing by electricity, the advantages of which are not so palpable.

A very neat use for electric motors would be for hoisting ammunition. On board the Atlanta we use five men at each shell hatch, and their work could be done more quickly and quietly by a 2 horse-power motor costing, say, $200. This would require one man to operate it, and would leave four men from each hatch for work at the guns. Coal could be similarly hoisted on board. Since all our new ships are fitted with dynamos for feeding electric lights, why not have them feed electric motors also, every horse-power developed by the motors being about the same thing as adding, say, nine 16 c. p. lights. Of course, the dynamos must be safe below the water line, and they must all be similar, and feed into the same main wires, which go all through the ship like gas pipes through a city, the incandescent lights, search lights and motors receiving their supply from these main wires, and one, two, or three dynamos being run at a time, according to the number of lights and motors in use. Nothing could be more simple and effective than such an arrangement, and nothing could contribute more to the efficiency, health and comfort of a ship.

The Merchant Steel Association.—A joint meeting of the Merchants' Association of the United States, which is composed of the crucible and open-hearth steel manufacturers, and the Bessemer Merchants' Steel Association, composed of the Bessemer steel manufacturers, was held in the Monongahela House, Pittsburgh, on Wednesday, the 27th ult. The meeting was fairly well attended, about two-thirds of the members of each organization being represented. After a full discussion on the present condition of trade was had it was resolved to make no change in the list of extras recently adopted by the associations. Business was reported to be rather dull, with no immediate prospect of an improvement. Nothing but routine business was transacted. The report published in some of the Pittsburgh papers to the effect that the meeting was held for the purpose of receiving the wage scales governing steel works to be presented by the Amalgamated Association is untrue, as neither organization deals with the labor question as a body, each member acting individually. The associations adjourned to meet in New York City some time during the present month.

The Iron Age

New York, Thursday, July 5, 1888.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR., - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - HARDWARE EDITOR.
JOHN S. KING, - - - - BUSINESS MANAGER.

Guns for the Army.

During the past few days an animated discussion has been going on in the Senate over an amendment to the Army Appropriation bill, emanating from the Committee on Military Affairs. The principal items of this amendment called for $750,000 for the erection and purchase of buildings, machinery and tools for an army-gun factory at the Watervliet Arsenal, West Troy. It provides for an appropriation of $5,000,000 for buying rough-finished steel forgings for 8, 10 and 12 inch guns, in quality and dimensions conforming to specifications, subject to inspection at each stage of the manufacture and including all the parts of each caliber. The successful bidder agrees to build a suitable plant and begin to deliver the steel for the smaller calibers at the expiration of not more than 18 months and that for the largest calibers at the expiration of not more than three years from the date of the acceptance of the contracts. It appropriates $500,000 for submarine mines, for continuing torpedo service and for instruction in the torpedo service and $100,000 for controllable torpedoes adapted to coast defense.

Considerable objection was at first raised to the amendment on the ground that it was not germane to the bill, but its relevancy was decided in the affirmative. The true character of the opposition was then developed in a speech by Senator Gorman, with whom Senators Plumb and Cockrell joined forces. In the absence of the full report of the remarks of the first named, which are not yet printed in the *Congressional Record*, the position can only be inferred by the replies it brought out. It appears to have been that it is wiser to await developments of inventive genius and private enterprise rather than to plan the work of providing for armaments and coast defense with the hands of army officials who do all they can to throttle progress which does not follow prescribed lines. The Missouri Senator opposed the appropriations chiefly on the ground that it is foolish to suppose that any foreign power will dare attack us, while the Kansas Senator read extracts from some mysterious authority who claims that the pneumatic dynamite gun has ceased to be experimental. This person asserts that the gun in question has a range of about 2 miles, "with the prospect that that range may be increased to 5 miles," and adds, "if ordnance officers were not a little impervious to the force of evidence, we should have had the solution of the harbor defense question settled by the general adoption of the gun."

The proposition to at last provide the United States Army with at least a few modern guns found its most powerful and best informed champion in Senator Hawley, who reviewed the history of the many efforts made to reach a clear understanding of the most pressing requirements of the service and the best means of meeting them. The concensus of opinion of four or five boards and commissions in which legislators, army and navy officers and civilians have had a voice has favored the plan adopted for the navy and now proposed for the army—viz., purchase of the rough forgings from private establishments, and the assembling and finishing of parts at a government factory. While the navy has the right to advertise for the building of 148 modern steel guns, and has a good many of them under way, the army, with the exception of three or possibly four, has not a single piece of ordnance capable of resisting modern ships of war. The start which it is proposed to give this branch of the service would enable it to acquire in a number of years, 50 12-inch guns weighing 50 tons each, 120 10-inch guns of 30 tons, and 100 8-inch guns of 15 tons.

However opinions may differ on the different systems before the country, either in the embryo state of invention or in the more advanced stage of at least partial backing by experiment or trial, we should recognize the crying necessity of having a few weapons of modern power about which there can be no doubt. We have complacently looked on while other nations down to the minor States of South America and semi-barbarous Asian countries have equipped themselves to wage modern warfare, congratulating ourselves that they were paying for experience which would cost us nothing We have proudly pointed to the brilliant record of American inventive genius coping with extraordinary problems in times of great emergency. Let it be granted that when the pinch does come some one, until then pitied and tolerated as a crank, will extricate us out of trouble by bringing out some new infernal machine. While it is being built and tested we have been at the mercy of any pugnacious third-class power. No one is less liable to get into complications with foreign countries, but nevertheless it may prove a very good investment to provide a modest equipment for the army, now that the small beginning with the navy is well under way.

Silver Coinage in Europe.

Some time since we referred to the decline in silver, and return to the subject because now, at the close of the first half year, the cause of the present depreciation begins to be better understood. There have been increased silver shipments to British India, the Straits Settlements and China; production has increased steadily and the demand for coinage purposes in Europe has diminished so far this year. Silver therefore has been unable to recoup the decline of 2¼d since January 1, and present prospects for a rebound are anything but encouraging.

Last year was still a tolerably active coinage year in Europe; this year the demand for that purpose is so slack that neither the Bank of France, on behalf of the French Government, nor the Banque de l'Indo-Chine, Paris, have so far availed themselves of the decline to coin some silver dollars for Tonquin, probably because they expect a further decline in the present condition of the Silver market, and the two institutions named are presumed to watch the silver market more closely than anybody else over there. The silver shipments to the East from January 1 to the middle of June were as follows:

	1888.	1887.
From London to India	£2,483,333	£1,527,550
From London to China	224,229	128,486
From London to the Straits	228,508	190,920
From Venice and Marseilles	233,197	942,009
Total	£3,169,267	£2,788,965
Increase		380,302

A glance at the operations of the European mints last year for purposes of coinage in the way of actual purchases of silver will enable us to form an idea of what is called in Europe a tolerably active year in this matter:

Silver Purchases by the Mints in 1887.

In	For	Francs.
France,	Cochin China	12,000,000
"	Hayti	2,000,000
England,	local fractional circulation	12,000,000
"	the Colonies	5,000,000
Switzerland,	local fractional circulation	1,000,000
Scandinavia,	circulation	700,000
Portugal,	"	5,000,000
Russia,	"	3,000,000
Austria-Hungary,	Maria Theresa thalers	6,000,000
Total		46,700,000

A reference to the different countries will give us a still better insight.

In France the colonial trade dollar is at the present price of silver only worth 3.77 francs, while the Mexican dollar is bringing 3.80. At no previous time did silver coin range so low in France. In England an extra effort was made last year in the way of coining silver for local purposes, including the famous jubilee 4-shilling pieces, £851,000 thus having been struck off. Now the United Kingdom has silver coin enough for several years to come, and this may also be said of the colonies whither fractional coin has of late years been shipped in large amounts. To Hong Kong, $1,210,000 went last year, direct from the mint, and to the Straits $79,000. Germany merely recoined 3,000,000 marks, and in Belgium the recoinage of 7,800,000 francs, commenced in 1886, was completed, and the profit of 500,000 francs made on that amount by the Government is set aside to figure as part of an offset against the eventual loss to be sustained on the amount Belgium will have to take off the hands of France when the Latin Union liquidates. Belgium will then receive about 250,000,000 francs, on which the loss to-day reaches the respectable figure of 75,000,000 francs. A more ruinous international concern than the Latin Union there certainly never was, if one of its smallest members is condemned to make such sacrifices.

Italy completed in 1887 the recoinage of 32,400,000 lire or francs of fractional coin. That country has still on hand 200,000 kg. of fine silver in the shape of old Neapolitan piastres, but has agreed not to recoin them into five-franc pieces. These piastres are a deposit in the vaults of the many issue banks as a reserve for bank-note circulation. On Feb. 29, 23,000,000 lire or francs were tied up in this shape. So far Italy has not been able to make up its mind to part with this accumulation of old piastres. Bankers have renewed their offers to the Government quite recently, but they were declined, the loss appearing too heavy. Switzerland, belonging to the

Latin Union, coined 1,400,000 francs last year, and had to buy 1,000,000 at Frankfort, but has now an ample circulation of fractional silver.

In Scandinavia only 500,000 crowns of 28c. American were struck off. Holland recoined to a moderate extent, only buying 180,000 guilders' worth of new silver, and Spain recoined 59,012,000 pesetas or francs' worth of old pillar dollars. Portugal coined 889,000 milreis, and Russia 1,500,000 rubles of a low standard. Austria-Hungary uses for its own circulation only domestic silver from its own mines, and continually shifts from bars to coin and *vice versa*, hence it exercises no influence through its mint operations on the silver market. The amount coined was 6,930,000 florins for Austria and 2,022,000 for Hungary. But, on orders received from Italy, Austria coined last year 3,175,000 florins' worth of Maria Theresa thalers for the use of the Italian expedition to Abyssinia, where this kind of coin has currency. A little silver was bought at Berlin to complete there the coinage of £435,000 Egyptian.

It will be seen that most of the European nations completed last year what there was still to be accomplished in the way of coinage and recoinage, which fact, we repeat, goes to explain the lack of demand for silver in that part of the world so far this year. In the absence of this element—usually an important natural prop--the near future of silver values appears all the more problematical.

The Salesman With Discretionary Power.

There are salesmen *and* salesmen. Many of them are fitted by nature and by experience to manage large interests, and their tact, judgment and knowledge of human nature enable them to succeed where others ignominiously fail. They can be given large discretion by their employers, who are confident that only in cases of absolute necessity will the lever of a lower price or an additional discount be pulled to secure an order. Other considerations will be brought into play by them, a sale at a good price being considered more of an achievement than a heavy order actually bought by a special inducement in cut rates.

It is an adage among salesmen that "any fool can sell at cut rates." If an inexperienced man, or one with limited resources has the power to name lower prices when necessary, he is very likely to think that every time he meets a buyer the emergency confronts him. If the buyer is indifferent, or is well supplied with goods, or prefers to wait for a week or two before deciding what to do, straightway the lever of a cut price is pulled and the power of that weighty influence is brought to bear. If the cut is deep enough, or if this is what the buyer has been playing for, a sale is effected and the salesman is happy, probably a great deal happier than his principal when the report of it is laid before him. In times of ordinary activity such a salesman will naturally do a large trade. Goods are moving, their places must be filled, and he is the very man all the buyers are looking for.

When trade is dull, however, and prices are dragging on the very bottom of absolute cost, the salesman with discretionary instructions is a serious demoralizing element. He does not possess the power to build up trade for his own house, but is able to make matters very uncomfortable for his competitors. The nail trade can be taken as an illustration of this. Prices are exceedingly low—so low that many factories prefer not to run rather than meet the commercial conditions now prevailing. The demand for nails is quite limited, and the most vigorous drumming cannot induce purchases of more than a few carloads. Those who need stock will buy, and those who have a supply will not buy. At such a time it is useless to offer inducements of lower prices, as the sluggish current cannot be moved without some still stronger influence. Yet there are salesmen who persist in forcing nails upon buyers with ample stocks, and who are so short-sighted that they do not see the effects of that course communicated all along the line. Such salesmen should have their instructions remodeled, and it would probably not hurt very much if they were to be rebuilt of something in the nature of cast iron. This is a feature of the situation worth looking into by those who are anxious to improve the condition of trade, whether in nails or in other staple goods sold through salesmen.

A New Bar Iron Association.

Representatives of rolling mills in Ohio, Indiana, Michigan and Illinois, met at Cleveland, on the 27th ult., to form an association for the bar iron trade. The name adopted is "Association of Bar Iron Manufacturers." It is intended to regulate matters pertaining to the conduct of the iron business in order to secure more harmonious action among the manufacturers of the States named. No attempt is to be made to dictate prices or to order a stoppage of the mills. Nor will the question of wages be interfered with, and the signing of the scale is to have no place in its deliberations. It cannot be called a trust, as reported in dispatches from Cleveland to the Western papers, but it is simply an association of manufacturers like a great many other associations existing all over the country. Being a business association, its proceedings are private. Meetings are to be held subject to the call of the secretary or Executive Committee from time to time to discuss the situation of trade and to take such action as may be deemed desirable. While the report is incorrect that "each manufacturer agreed to regulate his output and to shut down when ordered and to leave prices to the association," yet an attempt will be made to keep prices steady by the more thorough interchange of information with one another and the investigation of reported low sales and cut prices before they are allowed to influence other transactions. The necessity for doing something to correct the condition of affairs in the bar iron trade is shown by the fact that bar iron has been sold on a parity with old rails at $16, although they have not been bought laid down at the mill within $2.50 to $4 of this price. Further, it may be stated that, in previous periods of depression, when bar iron was sold so low, the card of extras was not cut completely in two as now, but full extras were obtained on many sizes. The following permanent officers were elected: Myron C. Wick, Youngstown, president; S. A. Fuller, Cleveland, vice-president; C. W. Scofield, Cleveland, treasurer; George H. Taylor, Cleveland, secretary. The executive committee consist of Major Collins, Brazil, Ind.; James Neilson, Youngstown; H. O. Bonnell, Youngstown; J. S. Van Alstyn, Detroit; M. Churchill, Zanesville, Ohio; R. H. Lewis, Chicago. The details of the organization have not been entirely completed, but the promotors hope to secure the co-operation of at least four-fifths of the manufacturers of bar iron in the region covered.

Windmills for Electric Lighting.

With the extensive and constantly growing application of wind-power, specially noticeable in the West, where the windmill for pumping has become a familiar landmark, it is all the more noteworthy that this motor has not been pressed into service to any appreciable extent for isolated electric lighting on the storage battery plan. It cannot be because of lack of efficiency on its part, as the contrary is being demonstrated daily, and the low percentages of accumulated energy hitherto yielded by storage batteries may therefore, with some reason, be held accountable for the neglect which has been shown in the matter. Even this cause, however, if such it be, has of late lost in importance, the development and improvements in the manufacture of storage batteries having been such as to impart to them a reasonably high degree of efficiency. While the correctness of the remarkably economical figures claimed for some of the types now in the market may well be questioned, an average return of at least 60 per cent. of the electrical energy put into an accumulator may be expected, and with this a combined windmill and storage battery plant should, in certain locations, offer superior inducements as a means of supplying electric light. The power, strictly speaking, costs nothing beyond first cost of the motor and interest, the expenses of maintenance and wear and tear, and the sum involved in procuring the dynamo and batteries, whether in the shape of a price with interest, &c., paid for their purchase outright or in the form of a fixed rental, paid to a controlling company. The necessarily fluctuating character of the power would scarcely be very objectionable since the energy would be stored whenever available, at intervals perhaps, in comparatively small amounts, a large enough storage capacity being provided, and drawn off when desired. The working expenses would be small and the power supply sufficiently reliable for the purpose to be accomplished. In only a few cases, however, that we know of has advantage been taken of the system, and then mainly for experimental purposes.

A record of the results obtained in one instance was given a few weeks ago in a paper presented to the Glasgow Philosophical Society, and, though rather incomplete, was none the less valuable because of its direct practical significance. Professor Blyth, the author, had fitted up a small windmill plant for lighting a cottage, the windmill being after old English type, erected in the garden. The tower consisted of a wooden tripod, suitably braced, and supported the wind shaft 33

feet above the ground; four sail arms were used, each about 13 feet long. The dynamo, also an old form, was driven directly through a rope and charged 12 cells. With this arrangement ten eight-candle power lamps were easily supplied, and, with a good breeze blowing, as we find it stated, there was sufficient storage in half a day to supply the lights for four evenings of about four hours each. A cut out arrangement disconnected the cells from the charging circuit when the dynamo ran below a certain speed, so that the action was entirely automatic and the windmill could be allowed to run day and night without danger of the cells discharging themselves through the dynamo. The possibilities of this plant, with all its imperfections, afford some measure of what might be accomplished with improved appliances and should encourage further work in the same line. With windmills of the latest type, storage batteries and dynamos of modern construction and a general improvement in all the working conditions, as now attained, additional experiments would be well worth trying.

Building Up New Towns.

We have frequent occasion to admire the enterprise which characterizes the inhabitants of the "new towns" of the country. They realize the necessity of calling the attention of adventurous spirits elsewhere to the opportunities still existing for the rapid accumulation of wealth. They appeal most strongly to the residents of the older East, whose surroundings have become more or less rigid by an apparent development of wealth-producing influences to a point of slow growth. Many turn anxiously toward some newer section of the country with the American hope in their breasts of "bettering their condition." The channel most convenient to reach these people sighing for a change of condition is the newspaper. Much is being accomplished by the press of the new towns in this direction. The "special editions" coming under our notice from time to time are almost invariably highly creditable to the towns whence they emanate. Whether they originate in the South or the West they breathe the true spirit of progress, and although too apt to exaggerate advantages and conceal defects they are a very important factor in securing a diffusion of population which is perhaps of as great consequence in this vast country as the direct pecuniary benefit of the individuals influenced.

This is not always a matter of real estate speculation, although it usually happens that holders of real estate profit most when a new town is started. We have in mind notable exceptions to this rule, in which the promoters of towns have discouraged all efforts at "booming," and have bent their energies in the direction of solid, substantial growth, leading to enduring prosperity. Towns depending for their existence upon the development of iron or coal interests have too frequently been the prey of the real estate boomer, who invariably points to Pittsburgh as an example of what coal and iron will do in building up a city, but forgets to say how many years it has taken and what other influences have played a very important part. Alabama's Birmingham may be further cited as an instance of the wonderful growth, in a few years, of a rural hamlet to a vigorous city, solely because of the mineral resources of the vicinage, but it should not be forgotten or overlooked that there are few, very few, localities in this or any other country so richly endowed by nature with all the essentials for making iron.

Although but few towns in this country are destined to be great manufacturing centers of far-reaching influence in the production and manipulation of iron, there are countless numbers in existence and yet to spring up in which manufacturing will be prosecuted in a modest, unpretentious manner, with no special flourish of trumpets, but with sufficient vigor to vitalize the neighborhood and properly diversify occupations. These towns may not all produce the iron which they manipulate, but they may have special advantages of some kind for the manufacture of articles of more or less general use. Nor is iron the only consideration to be viewed in this connection, although it naturally occurs to us in the most prominent light, being connected with the iron trade, and besides that it underlies in its partial use such a vast congeries of other industries. The way is open in the South and West, which has long been traveled in the East, for the introduction of more and more occupations to the great advantage of the localities in which they are planted and to the ultimate benefit of the whole country.

Increased population and new industries must enter the new towns together. This is the mission of the enterprising advocates and local advantages and attractions to whom we are referred. They are striving to secure both influences, and the intelligent zeal with which the movement is conducted must result in an increased migration from our overloaded centers of population and our full-grown Eastern factory towns to these promising points of new life and more bustling enterprise.

During the past few years the whole German iron trade has resolved itself into a series of pools, rings and combinations who run, or attempt to run, the business at home and abroad. Occasionally, in the plenitude of their power, they develop a despotism which must be startling even to some of the staunchest adherents of the system. A striking example is furnished by a circular lately issued, signed by 20 pig-iron manufacturers of the Siegen district. It appears that a firm in Frankfort offered for sale 7000 tons of pig iron for delivery during the second half of 1888 at a price lower than that fixed by the combination. Their offers were disturbing the trade, and it is asserted that investigation showed that they were trying to sell what they did not own. Indignation ran high, and the 20 firms alluded to appended their signatures to an agreement by which they bound themselves not to sell any iron to the audacious firm for the balance of the year—in other words, the firm in question was boycotted solemnly.

The fact is recorded by the *National Car and Locomotive Builder* that a class of locomotives on the Wisconsin Central were noted for a jarring, uncomfortable rattle about them when running at high speed. A great many experiments were tried to find out the cause of the annoyance, and it was generally supposed by experts to be in the running gear, but no change that was suggested made any difference. When Mr. John Player took charge of the road's machinery his attention was soon directed to the engines referred to and their jarring tendency was complainingly dilated upon. Mr. Player rode a few trips on one of the engines and watched her performance carefully. He concluded that the trouble was caused by the side rods being too heavy. The rod without the straps was 91½ inches long and weighed 198 pounds. He reduced the rod in size sufficiently to lower the weight to 153 pounds. This cured the jarring. The rods remained sufficiently strong for the work they have to do.

The Wheeler Patents.

A Company was formed last week in this city to manufacture and control the sale of products to be manufactured under the patents of Elbridge Wheeler, of Boston. Among the directors of the company are George A. Evans, representative in this city of the Bethlehem Iron Company; Hon. John H. Rice, of Worcester, Mass., and Elbridge Wheeler. The latter has been long identified with efforts to produce composite articles of iron and steel, and of different grades of steel. He has made some interesting products, among which bars of high carbon steel with a soft center are notable. The leading feature in connection with them as contrasted with compound bars, soft center plates, &c., being that there is no union between the two metals, that no weld is attempted. Among other articles a rail has been rolled a few weeks since at the Bethlehem Iron Works from such a composite ingot, the center being soft steel, while the surface is steel much harder and higher in carbon. It is claimed that such a product would combine the valuable properties of hard steel for wear, with the immunity from breaking which the mild steel center would give. A process which has in it the prospects of important developments is the sand core process, for producing annular and hollow shapes. Mr. Wheeler makes the core by filling a box of the proper shape with sand, around which the steel is cast, generally by bottom casting. He has found that ingots with a sand core can be rolled and hammered in the usual way, and samples submitted show that under the treatment the sand has been considerably pitted to a solid mass, the existence of which would aid the iron in resisting compression strains, like in pillars, &c. By allowing the sand to flow out, after casting and before rolling, annular blanks for tubes, hollow axles and shafting, &c., are readily obtained.

Composite Steamships.—In the notices which have appeared in English papers on naval architecture at the Glasgow Exhibition attention has been directed to the models of two composite screw steamers intended for the Newfoundland and Labrador mail service, and which, in their way, are decided novelties. Owing to the quantity of ice encountered in these waters during a great part of the year, the owners of the vessels determined to frame them with iron and sheathe the frames with stout hardwood planks, the latter material being, in their opinion, better suited to endure blows from the ice than ordinary thickness of iron or steel plating used in vessels of 700 tons. The bows of the ships are shod with stout iron plates, and the rudders are also of iron. Composite vessels, and particularly steamers, are rarely met with at the present day, and these, we are told, are the first vessels of the kind that have been built upon the Clyde for very many years.

CORRESPONDENCE.

The Number of Men Engaged in the Iron Trade.

BUFFALO, July 2, 1888.

To the Editor: Will you kindly inform us how many persons are employed in the iron trade in all its branches from miners of coal and ore and makers of coke to the finished product? FORGE.

We may state that at the outstart we have no figures later than those of the Census of 1880, although they may be used as the basis of some estimate, as follows. The Census figures were:

	Product 1880. Net tons.	Men employed.
Pig iron	3,781,021	41,875
Iron rolling mills including nail	2,353,248	80,133
Bessemer and open-hearth steel works	983,039	10,835
Crucible steel works	75,275	5,196
Forges and Bloomaries	72,557	2,939
Total	7,265,140	140,978

For the year 1887 the following estimate may be made covering the same ground:

	Product, 1887. Net tons.	Estimate No. of hands same proportion.
Pig iron	7,187,206	80,125
Iron rolling mills	2,588,500	89,000
Bessemer and open-hearth steel works	3,433,491	37,840
Crucible steel	84,421	5,820
Forges and Bloomaries	43,306	1,750
Total	13,336,924	214,536

From this probably at least 10 per cent. must be deducted to allow for the fact that a greater output is being made with less labor in all departments of the iron trade, and notably in blast-furnace work. This would leave it roughly 193,000 hands in the iron and steel works themselves.

The quantity of iron ore used in 1880 was as follows:

	Tons.
Blast furnaces	7,256,684
Rolling mills	363,959
Bess. and open-hearth	7,327
Crucible	2,128
Forges	79,610
Total	7,709,708

The number of hands employed in mining 7,064,829 tons of iron ore in the census year was 31,668. The output for 1887 is estimated at 11,300,000 tons, which would indicate a force of 50,600 hands.

In 1880 the consumption of anthracite coal by furnaces and rolling mills was 3,222,498 tons. In 1887 it must have been at least 4,000,000 tons. In 1880, 70,748 hands produced 28,621,371 tons of anthracite, which would indicate 10,000 men for the iron works' fuel in 1887. In 1880 the furnaces and rolling mills consumed 5,659,055 tons of bituminous coal. Taking into account the fact that the steel works used relatively little coal, and that natural gas is widely employed, the fuel consumption of 1887 may be roughly estimated at 5,000,000 tons. In 1880, 41,850,054 tons of bituminous coal gave employment to 100,116 men. We would have 12,500 men for the above quantity. Allowing for the introduction of coal-cutting machinery, &c., it may be put down at 10,000 men.

In 1880, 3142 men were employed in producing 5,359,489 tons of coke, of which 2,277,555 tons were consumed in iron works. In 1887 the consumption was probably not short of 6,000,000 tons, which would call for 3500 men engaged in the labor of converting coal into coke. The number of men employed in mining the coal for the coke may be roughly estimated as follows: Taking 63 per cent. as the yield of coal when making coke, 9,500,000 tons of coal would be required, which would call for about 20,000 men. Then there are at least 2000 men employed in quarrying limestone and over 1000 in making charcoal. We thus make the following total as a rough estimate:

	Hands.
Furnaces and rolling mills	193,000
Iron ore mining	50,600
Anthracite coal	10,000
Bituminous coal	10,000
Coking coal	3,500
Mining coal for coke	20,000
Quarrying limestone	2,000
Making charcoal	1,000
Total	290,100

It is safe to say that in raising the raw material from the ground and manufacturing into merchantable products the iron trade gives employment to about 290,000 men. This does not include any of the force employed in water or rail transportation. It does not embrace the wire mills, pipe works, foundries, boiler shops, bridge and structural-iron shops, &c.—EDITOR.

Washington News.

(*From Our Regular Correspondent.*)

WASHINGTON, D. C., July 3, 1888.

The officers of the steel inspection service of the navy report that the supply of material for the cruisers Newark, Philadelphia and San Francisco and gunboats Concord and Bennington has been practically completed, and that those vessels will be ready for launching in a very short time. The cruiser Baltimore, at the Cramp yard, will be ready in about two weeks. The result of the completion of the hulls of this first batch of vessels has been of immense value to the metallurgical interests of the country. It has demonstrated that the United States Government is not dependent upon the steel-makers or the shipbuilders of foreign countries for the material or the ability to construct steel ships of war. In looking back to the beginning, and recalling with what almost despairing effort the manufacturers entered into the production of metal up to the standard requirements of the Navy Department, and how promptly they met the issue and triumphed in the best results in high-grade steel, we observe one of the greatest tributes to the energy, enterprise and skill of American producers. It is now said at the inspection office that the production of high quality steel is now accepted as a matter of course, and that the results show even greater skill in manufacture and application to other purposes.

The 6-inch steel cast gun is still undergoing the process of rifling and finishing at the Washington Naval Arsenal. It is not expected that it will be in condition to send to Annapolis much before September. The charge will be 50 pounds of powder and a 100-pound projectile. The greatest interest is manifested in ordnance circles as to how this gun will behave. It is now a question whether this gun shall be put to the statutory test only or be put to the full trial of its life by firing it until it bursts. Unless this be done the ultimate limit of its powers in this direction will be purely speculative. In a test of two 15-inch guns at Pittsburgh, one exploded at 500 rounds and the other at 550, firing as rapidly as the guns would be worked in action. The life of a cast-iron gun has been established at 1000 rounds and steel guns are expected to do even better work. In a cast-iron gun the closing of the right and opening of the left vent renews its effectiveness for an equal period.

The navy is now in possession of 5136 guns, including howitzers. A record of the work of each one has been preserved. Of the new modern high-power steel guns 21 have been completed or practically so, and material for 148 has been ordered. The weights of these new guns, according to the ordnance figures, range as follows: 5 inch, 5000 pounds; 6 inch, 10,000 pounds; 8 inch, 27,000 pounds; 10 inch, 55,000 pounds; 12 inch, 100,000 pounds; and 16 inch, 100 tons. The latter sizes have, however, not yet been undertaken.

The two great armored ships will now soon be under way. The contracts for steel of the armored cruiser Maine, at the Brooklyn Navy Yard, to Carnegie, Phipps & Co., of Pittsburgh, show very satisfactory figures, viz., $89,779 for steel plates, $35,986 for steel shapes and $9737 for steel rivets. The Pittsburgh Steel Casting Company furnish the steel castings for $50,176. The contracts for hull material for the armored battle ship Texas will be awarded July 26. These will embrace plates, shapes, rivets and castings. The Texas will be built at the Norfolk Navy Yard. The naval officers are expecting the authorization of at least part, if not all, of the new ships provided for in the naval appropriation bills now before Congress. This will keep the work steadily moving along. By the end of the present year all the ships now contracted for will be afloat and ready for engines and armament.

The attack of Senator Gorman on the Ordnance Department of the army has naturally created a sensation. It was stated in official circles that most of what the Senator said was true. It is known that the ordnance branch of the army is far in the rear of the navy. The bold and aggressive stand of Senator Gorman will not stop at the burning of a little oratorical powder in the Senate. He will urge action upon the Department, where he expects to secure some changes which will bring this moribund branch into renewed youth and vigor.

A New Steel Company.—The Harvey Steel Company is a new organization which is about to purchase a site for a works at Jersey City, N. J., the organizers now having the refusal of two localities. The company consists of H. A. Harvey, president; Theodore Sturges, of the Oxford Iron and Nail Company, secretary; B. G. Clarke, of the Thomas Iron Company and the Lackawanna Coal and Iron Company, treasurer; Mr. Percy R. Pyne, of Moses Taylor & Co., being also interested in the concern. The company will build works to make steel under the patents of H. A. Harvey, who is well known as the inventor of machinery for the manufacture of cut and rolled wood screws.

The *Popular Science Monthly* describes a curious and ingenious device called "The Echo Maker," to be used on ships at sea. A flaring funnel is screwed to the muzzle of a rifle. When a supposed obstacle is near the vessel the rifle is fired in its direction, and if the obstacle is there the beam of sound projected through the funnel strikes the obstacle and rebounds, and as the echo is more or less perfect in proportion as the obstacle is more or less paralleled to the ship from which the gun is fired, and, as it is near or remote, the position of the obstacle may be inferred. The inventor claims that a sharp sound projected at or nearly at an object, and only when so directed, will in every case return some of the sound sent, so that, theoretically, there will always be an echo, and the difference in the time between the sound sent and the echo will indicate the remoteness of the object. The naval board tried the echo-maker and found that a return sound could be heard from the side of a fort ¼ mile away; from passing steamers ¼ mile off if broadside to; from bluffs and sails of vessels at about the same distance, and from spar buoys 200 yards away.

The Western Wages Contest.

The final meeting between the Conference committees of the Western Iron Association and the Amalgamated Association was held on Friday, the 29th ult., Mr. A. F. Keating presiding, and Messrs. James Neilson and William Martin acting as secretaries. Both sides argued in favor of the adoption of the scales presented by them. The manufacturers, through Mr. Keating, presented some additional facts and figures to show that it would be impossible for them to pay the present scale of wages and operate their mills. A detailed statement of prices obtained for their products now and prices obtained one year ago was presented which showed that a very great decline had taken place. Prospects for the coming year were also reported to be very discouraging. Orders are reported to be very scarce, while stocks on hand were reported to be very large. In view of these statements, which had been proven to the satisfaction of everybody present as representing the present condition of the market, the manufacturers would insist on the adoption of the scale previously presented by them. In behalf of the Amalgamated Association President Weihe stated that their people had submitted the case to the sub-lodges, and that a few of the manufacturers had been present at some of the meetings at which action was taken on the matter. The vote, he said, was nearly unanimous in favor of rejecting the proposition of the manufacturers. The lodges that did not vote to reject the scale left the matter in the hands of the Conference Committee. After Mr. Weihe had concluded the manufacturers retired. When they returned Chairman Keating reported that they had no further negotiation to offer, and adhered to their former scale. A motion was then made and carried to adjourn *sine die*. Secretary Martin, of the Amalgamated Association, stated that their scale would be printed and presented to the manufacturers for signature on Saturday, the 30th ult., in accordance with their usual custom. Those refusing to sign, their mills would suspend operations on that date. Notice has been received by Secretary Martin that two firms have already signed the scale, the Laughlin & Junction Steel Company, whose works are located at Mingo Junction, Ohio, and the Akron Iron Company, of Akron, Ohio, the latter concern employing about 500 men. A number of the concerns whose men are not controlled by the Amalgamated Association will continue in operation. Among these are the Black Diamond Steel Works, of Park, Brother & Co., Limited; Wm. Clarke, Son & Co.; the two mills of W. D. Wood & Co., Limited, at McKeesport, Pa., and Wellsville, Ohio; the Lake Erie Iron Company, of Cleveland, Ohio, and the steel works of Carnegie Brothers & Co., Limited, at Braddock, Pa. The Homestead Steel Works, of Carnegie, Phipps & Co., Limited, at Homestead, Pa., and the Twenty-ninth Street Iron Works, belonging to the same firm, also closed down on Saturday, the 30th ult., as did the Union Iron Works, of Carnegie Bros. & Co., Limited. Several conferences were held last week between President Weihe, of the Amalgamated Association, and General Manager R. W. Jones, of Carnegie Bros. & Co., Limited, for the purpose of arranging a steel scale for their works, but up to this time no scale has yet been prepared that is satisfactory to both sides, although it is so near adjustment that it will be signed at an early date. For the other works of Carnegie's outside of the Homestead mill the demands of the men have been acceded to after the adoption of modifications which are practically identical with those agreed to in the case of Oliver Brothers & Philips, to which we refer below. Both the Twenty-ninth Street Works of Carnegie, Phipps & Co. and the Union Iron Works of Carnegie Bros. & Co. start up Thursday.

A number of the manufacturers who were interviewed on the trouble all united in saying that they were better prepared this year than ever before to stand a lockout, and that their mills would remain idle until their scale had been accepted. Job L. Boyer, of the Globe Rolling Mill Company, Cincinnati, Ohio, expressed his views on the situation as follows:

"The manufacturers are determined to insist on their scale They have to do it. Necessity compels them. The iron mills of Pittsburgh haven't made any money during the past year; but they have been paying the 10 per cent. advance made last year. Now, when the situation is changed for the worse, the men are unwilling to come down. The Conference Committee admitted that one roller was making $32 a day. I wouldn't care if I could make that myself. The head men are well paid, and probably can stand a lockout, but there is a host of laboring men who do not make more than from $1.25 to $1.50. These are the people who will suffer the most, but they are not considered. I must say that in Cincinnati we are not overstocked. I wish we had twice as much on hand as we have now. We will be satisfied, however, to shut down, because we have some repairs to make."

From present indications the lockout will be a prolonged one, although the situation is liable to change at any time. Considerable dissatisfaction is expressed both by the manufacturers and the public at the course pursued by the officials of the Amalgamated Association in refusing to meet the manufacturers half way in the matter and endeavor to arrange a compromise scale. Such a proposition was made by the manufacturers, but was rejected by the Amalgamated committee.

Oliver Brothers & Phillips signed the scale on Saturday, because they were obliged to keep their works running to fill a number of large contracts, among them one for a traction railroad. They signed after securing certain modifications. The item relating to crop ends was stricken out of the memorandum of agreement as follows: That for all crop ends on finishing mills used for merchantable purposes the same shall be paid for. The 1¼ angles were changed from $4.10 per ton to $3.20 and 1½ angles were changed from $4.10 per ton to $3.65, and the roll turners' scale was stricken out entirely. Oliver Brothers & Phillips' is a Clapp-Griffiths steel plant, and for the first time since it has been in operation a wage scale has been prepared and signed by the firm and the Amalgamated Association, which will govern the wages paid in these works. The scale is somewhat similar in its conditions to the iron scale, being in force from July 1, 1888, to July 1, 1889. There is one other Clapp-Griffiths steel works in Pittsburgh, and this is operated by the Spang Steel and Iron Company, the works being located at Etna, about 4 miles from that city. It is believed that a steel scale governing these works will also be agreed upon in a few days, and that no serious stoppage of the works will take place. This firm should not be confounded with that of Spang, Chalfant & Co., owners of the Etna Iron Works, also located at Etna. This firm have emphatically refused to sign the iron scale, and their works are closed down in all departments.

The other firms who have signed are P. H. Laufman & Co., Limited, of Apollo, Pa.; the Lookout Iron Company, of Chattanooga; the Findlay Iron and Steel Company, of Findlay, Ohio; the Aurora Iron and Steel Company, of Aurora, Ind.; the Maumee Rolling Mill Company, of Toledo, Ohio; the Akron Iron Company, of Akron, Ohio, and the Republican Iron Company, of Pittsburgh. The latter starts up Thursday.

The trade is much divided on the question whether in reality any prolonged suspension of work is to follow. Although a good many manufacturers earnestly and sincerely believe that their only recourse in the present condition of the iron trade is to insist upon a reduction of wages, there are others who enter upon the contest with doubtful views as to its propriety. A leading manufacturer has stated that the low prices prevailing are due alone to the action of the manufacturers. It is stated that two weeks after the reduction of wages had been carried, the manufacturers would be as badly off as ever, since they would give away what they had secured in their efforts to secure business. It is not believed that the stoppage will have more effect than that which usually results from closing down for a few weeks to make repairs. Probably the first effect of a cessation of work for any length of time will be to relieve the Eastern markets of the pressure of competition from mills west of the Allegheny Mountains—a pressure which has been keenly felt during the past few months. At present relative prices East and West, even at cut rates of freight, very little if any iron can be sent West by Eastern mills. It would take a stoppage prolonged beyond July to lead to such shipments. Thus far only two important mills have signed the scale, the others being small, but stocks in the West are moderately large, and are regarded as ample enough to cover requirements for a few weeks. The opinion is expressed in the trade that the effect of the strike, if carried along through July, will be negative—that, in other words, it will avoid a further weakening, which would have followed the immediate signing of either scale.

Undervalued Steel Blooms.—A large quantity of imported steel blooms were sold on the 28th in New Albany, Ind., by the Custom authorities, for duties, freight, &c. This lot was a shipment on a sale of 5000 tons made some time since by Andres Joachams, of Charleroi, Belgium, to the New Albany Rail Mill Company. The rail mill bought the blooms at a very low price, through a local firm, acting as agent for the shipper, and the sample lot of about 20 tons came through the Custom House, undervalued, but the surveyor, knowing it to be only a sample, allowed it to pass, suspecting at the time some sharp trick. When the first regular shipment of about 400 tons came through, it was likewise undervalued, and was seized by the authorities for full duty, the rail mill having refused to pay the draft and receive the blooms, perceiving something crooked. Mr. Gathright, surveyor of the port of Louisville, states that Joachams has systematically defrauded numerous buyers through the country, the principal victim being a firm in Terre Haute, Ind., who, upon making a contract with Joachams for a heavy purchase of blooms, deposited a letter of credit in England, against which the shipper could draw with bill of lading attached. On each shipment after the papers had been officially approved, he would raise the amounts on the drafts, and, in this way, secured all the funds before half the goods were shipped. The entire lot in question was purchased by the Paddock-Hawley Iron Company, of St. Louis, for $20.30 per ton, which is about $6 below the market price, making about $7000 including duty, charges and freight The frauds of Joachams were first detected at the Louisville Custom House, and immediately reported to headquarters.

Foreign Markets.

EQUIVALENTS.

	Cents.
Franc, Peseta or Lira	19.3
Florin (Netherlands)	40.2
Florin (Austria)	35.9
Milreis (Portugal)	$1.08.
Milreis (Brazil)	54.6
Mark (Germany)	23.8
	Pounds.
Kilogram	220.5
Picul	134.

BRAZIL.

PARA, June 29, 1888.—*India Rubber.*—Our market has stiffened; there is little disposition to sell, the available supply not exceeding 20 tons. Receipts have been small, and are not expected to increase.—*Per cable direct.*

EAST INDIES.

MANILA, June 25, 1888.—*Hemp.*—There are buyers at $8.31¼ ℔ picul, against $7.37½ same date last year, equaling ℔ ton, cost and freight, £28. 5/, against £25. 12/6. Clearances for the United States since last cable amounted to 8000 bales, against none last year, and since January 1 to 91,000 bales, as compared with 123,000 last year, the quantity loading being 8000, against none. Clearances for the United Kingdom, since January 1, have reached 168,000, against 93,000, while there are still loading 14,000, against 20,000; cleared for all other ports, 40,000, against 20,000; receipts at all ports since last cable, 15,000, against 9000; and since January 1, 208,000 bales, against 228,000 last year and 195,000 in 1886. *Freight*, $5.50, against $5, and *Exchange*, 3/5¼, against 3/5¾ last year.—*Ker & Co. per cable direct to Chas. Nordhaus, New York.*

SINGAPORE, May 16, 1888.—*Tin.*—There have been no transactions in this market since the 2d inst., but in Penang business has been done for China up to $35 ℔ picul. Sellers might accept $40, and Chinese buyers would give $35, but European shippers make no offers, and stocks in all quarters are accumulating. *Tonnage.*—Steamer rates to London are rather weaker, and a drop is not improbable. We quote weight at 27/6 @ 32/6. For New York via canal Tonnage is expected shortly, and some engagements are reported. Via Cape the Emily L. Boyd and W. Anton are offering room at 22/6 @ 25/, for weight. For Boston no fixture is yet reported. During the first four months shipments from the Straits to America were as follows during the years 1888 to 1883 respectively: 10,014 piculs, 28,004, 21,861, 12,689, 22,867 and 34,866. *Exchange* weak at 3/0¾.—*Gilfillan, Wood & Co.*

AUSTRALIA.

MELBOURNE, VICTORIA, June 15, 1888.—*Iron.*—The weakness in several articles has disappeared; all sell well at present at firm prices. We quote Galvanized Iron £17; Fence Wire, £10, and Scotch Pig, Clyde No. 1, £5.—*Per cable via Europe.*

MEXICO.

MEXICO, June 24, 1888.—*Drainage.*—The City Council has made a contract with the London-Mexican Prospecting and Finance Company for a 7 % loan of £400,000, with 1 % ℔ annum sinking fund, at 82½, for the purpose of carrying out the drainage of the Valley of Mexico.—*La Libertad.*

JAPAN.

YOKOHAMA, May 10, 1888.—*Copper.*—The French syndicate have contracted for the output for three years of two of the leading Copper mines in Japan, amounting to seven-eighths of the total Japanese output. Baron Sadoine, the former general manager of Cockerill in Belgium, has recently visited China and Japan, and been instrumental in forming a Belgian syndicate for the extension of trade with Japan. The chief firms constituting such syndicate are the Angleur Steel Works, the Dyle-Bacalan Company, the Malines and Willebroeck Structural Iron Company, the Société Internationale de Construction, the metal firms Nicaise & Delcuve, Halot Frères, Caramin, Bael, and the Compagnie Générale des Conduites d'Eau.—*Echo.*

SPAIN.

BILBAO, June 16, 1888.—*Iron Ore.*—During the fortnight a better feeling has prevailed by degrees, leading to more doing. Still, business does not yet come up to what it was last year. Only a few single cargoes have been taken at 6/10 @ 7/3 Rubios and 7/6 @ 8/ Campanil. The latter is getting scarcer and scarcer through exhaustion; holders thereof are correspondingly firm. Total shipments since January 1 sum up 1,748,158 tons, against 2,113,369 same time last year. *Pig Iron* has been moderately active; the week's export has been 1749 tons, while 659 tons have been shipped coastwise.—*Bilbao Maritimo y Comercial.*

SWEDEN.

STOCKHOLM, June 21, 1888.—*Iron.*—At the instigation of the Swedish Export Association the sales office of Swedish Ironmasters has resolved to send a special agent to China and the East for the purpose of pushing in that direction the export of Swedish Iron.—*Dagbladet.*

GERMANY.

HAMBURG, June 23, 1888.—*Iron.*—The scarcity and high price of Iron Ore at Siegen and Nassau sustains the Pig Iron quotations. The demand for Spiegel has been rather on the increase. Forge Pig has, on the other hand, been duller, yet sustained. Orders extend to September 1 next. Stocks are not large and not being increased just now, as the taking of inventories impends. Foundry Pig has remained as firm as before. Thomas sells with greater ease than Bessemer, but the latter still brings 54 @ 54.40 marks. Luxembourg is bringing 34 @ 38; English Bessemer, 42/ on the West Coast. Merchant is quiet, with a slightly improved domestic demand; still, production will have to be curtailed, the export still dragging, though perhaps slightly better. The demand for Boiler Plates is, if possible, brisker than at any previous time and prices have been raised to 170 marks and for Tank Plates to 150. Wire Rods for export have been reduced 5 marks ℔ ton, to facilitate exportation. The Wire-Nail convention has been prolonged, but it does not include the few leading concerns. Railway cars are doing well. Negotiations for the renewal of the Steel-Rail syndicate continue unabated. Advices both as regards Iron and Steel from Upper Silesia are of the most reassuring nature. *Metals.*—Lead has become very lively here and is looking up.—*Borsenhalle.*

Silicon in Tool Steel.

Dr. Friedrich C. G. Mueller, of Brandenburg, Germany, who has acquired the reputation of being among the leading authorities on metallurgical subjects in Germany, has lately added to his earlier investigations, the results being published in *Stahl und Eisen*, on crucible steel. He has probably been the first to call attention to the importance of silicon in the manufacture of that class of steel. In spite of the fact that it is well known that the best Sheffield steel often contains as much as 0.5 per cent. of silicon, some prejudice has existed against its presence in any quantity. Dr. Mueller determined to investigate the matter, and with the aid of Felix Bischoff, a steel maker of Duisburg, Germany, made and tested a series of high silicon steels, by additions of 15 per cent. ferrosilicon. Unfortunately the presence of 0.2 per cent. of phosphorus in this material made it impossible to use more than small quantities of it. Dannemora stock was used, containing only faint traces of sulphur, 0.006 per cent. of copper and 0.015 per cent. of phosphorus.

First four soft samples of steel were made for wood-working machinery, being hammered down to 1.77 to 0.24 flats. All of them were used for 10 months in planers in a factory for making picture frames, the foreman reporting that they were equal to the best English steel, and that no difference could be observed in grinding or working except that samples A and A′ were a little harder. The chemical analysis of the samples showed the following compositions:

	Carbon.	Silicon.	Manganese.	Phosphorus
A	0.783	0.342	0.37	.....
A′	0 826	0.240	0.43	.
B	0.6 (color test)	0.193	0.27	.....
B′	0.574	0.478	0 20	0.019

A more extended series of experiments made with silicon steel in the machine shop of Gebrueder Wiemann. A good hand at the lathe, skilled in preparing his tools, was given 1.18 inch square boss, with arbitrary marks. Both the proprietor of the works and Dr. Mueller watched his work constantly. The material for the analyses was taken by drilling from the tools in use so that Dr. Mueller knew their composition only after their behavior in work was known. Steels C to F, both inclusive, were made from the best Dannemora stock, G being produced from cheaper Swedish stock for ordinary goods. This steel was tested with the object of ascertaining whether the effect of phosphorus becomes noticeable when it goes beyond 0.02. Finally analysis H represents the steel usually employed in the shop, bearing the name of a well-known Austrian maker.

	Carbon.	Silicon.	Manganese.	Phosphorous.
C	1.050	0.229	0.41	0.015
C′	1.075	0.695	0.52	0.023
D	1.188	0.575	0.40	0.018
E	1.091	0.690	0.37	0.019
F	1.114	0.684	0.40	.....
G	0.941	0.377	0.36	0.028
H	1.017	0.226	0.32	0.024

All the samples were used for 15 months in doing work of the most varying kind in the lathe on iron, steel and cast iron. All proved to be first quality, D being the best, followed closely by E, which is a little softer. Both of them are ahead of anything yet known at the shop. Whenever larger contract work is to be done they are taken out and a depth of cut and speed is used with them which is otherwise considered dangerous. In cutting V screws the point of the tool stands four times longer than with ordinary steel.

Steels C and C′ are not far behind, C appearing to be a little more brittle. It is worthy of note that in these tests the slightly higher phosphorus contents of G did not effect it injuriously as far as observation went. Accidentally a surprising observation was made. A sample of the soft wood-planing tool-steel B′ was kept at the machine shop. Without Dr. Mueller's knowledge it was used for a lathe tool and it was reported that a steam cylinder had been bored out with it, the edge remaining intact after 18 hours' work. Some mistake in marking was suspected, but a color test for carbon showed 0.6 per cent. and the silicon analysis proved that it was the identical steel. Afterward the same steel was used for working iron, and chiefly on screws, the report being that it was equal to C and C′.

The result of these investigations would indicate that silicon, to the extent of 0.8 per cent., has no deleterious influence upon the quality of crucible tool steel, and it may be true that 0.5 to 0.6 per cent. of silicon actually improves the quality.

Iron Ore at Wausau, Wis.—A large deposit of iron ore has been opened up near Wausau, in the central part of Wisconsin, which is reported to contain 67 per cent. of metallic iron and to be low in sulphur and phosphorus. The first train-load of ore was shipped from the mines on the 26th ult., and the occasion was celebrated by the citizens of the town with great enthusiasm. Ninety carts were loaded with ore, to be hauled to the cars, and the citizens formed in procession behind them and marched to the railroad, while a band took the lead of the line. After the ore had been formally loaded the party marched to a hall and partook of a banquet.

A correspondent of the United States *Army and Navy Journal* asks: "What is the longest piece of ordnance that has ever been successfully fired?" and receives the following answer. "If you include in the term ordnance everything that carries a projectile, we should answer 14 miles. This is the straight tube conveying natural gas from Murrayville to Pittsburgh. To clear this tube out a projectile known as the 'gum-ball' was inserted in the end at the gas well, closely fitting the interior; the gas was then turned on full force and the gum-ball fired through its full length, coming out at the further end in a few minutes."

In the construction of the Eiffel tower, at Paris, 2,500,000 rivets will be used.

Recent Legal Decisions.

TAXATION OF GOODS—COAL IN BARGES.

A coal company in Pennsylvania sent their coal down to Louisiana in barges for sale there; the coal was not consigned to any one, and the company had no agent there. The sheriff of one of the parishes levied on the coal which was in the barges in the Mississippi, it not having been landed, to sell it for the taxes which had been assessed upon it as property in the State. The company brought suit for an injunction to restrain the sale—Pittsburgh and Southern Coal Company *vs.* Bates—on the ground that the law directing the taxation was in violation of the commerce clause of the Federal Constitution. A preliminary injunction was granted, but on the hearing the suit was dismissed, and on the appeal taken to the Supreme Court of Louisiana the judgment below was affirmed. The chief justice, Bermudez, in the opinion, said: "Unnecessary pains have been taken to establish the elementary proposition that goods in transit from one State to another cannot be lawful objects of taxation during their passage in transportation in the State and through the States lying between that of the origin and that of the destination of the goods. There is no doubt that such goods cannot be taxed. But this coal is not in transit. The facts that it was kept on board the barges, or flats, which carried it, and was not unloaded, nor consigned, and that the company had no special agent in the State for its sale, are not material. It was sent down the Mississippi River to supply the Louisiana trade, and it reached its destination, and was offered for sale, and sold in part, and the rest is now for sale. In the case of Brown *vs.* Houston the Supreme Court of the United States decided that goods become the lawful objects of taxation the moment they reach their destination, where the statute provides for such taxation, for it cannot be seriously contended, at least in the absence of an act of Congress, that all goods which are the product of other States are to be free from taxation in the States to which they may be carried for use or sale. It is clear that this coal had become intermingled, on its arrival here, with the general property in the State of Louisiana, and is subject here, as all other personal property is, to taxation."

PARTNERSHIP DISSOLUTION.

P. & W. were partners and they dissolved their firm, with authority to each to sign in liquidation, and the notice of dissolution was published in the neighborhood paper. P. subsequently indorsed a note made by his brother "P. & W. in liquidation," and when it was not paid the holder, W., brought suit upon it and sought to hold the firm as indorser. W. defended on the ground that as the indorsement was made for the accommodation of P.'s brother, and not for the partnership purposes, he was not liable, he not having ratified the act of indorsement; but he was defeated because of the charge of the court, who said: "A note executed or indorsed by a partnership, whether during the existence thereof, or in liquidation by a partner authorized to use the firm-name in liquidation, is presumptively the act of the firm, and it devolves upon any member of the present or late firm who is sued upon it to show that it was not used for partnership purposes." The case, Woodson *vs.* Wood, on appeal to the Supreme Court of Appeals of Virginia was reversed. Judge Lacy, in the opinion, said: "If authorized verbally or in writing one of the former partners may bind the firm, after dissolution, as a party to a bill or note, but authority to settle or close up the business of a firm does not imply authority to one partner, after dissolution, to give a note in the name of the firm for the firm's debt, or to renew one given before dissolution. Nor will authority to give or renew a note be implied by authority 'to settle business of the firm and sign its name for that purpose;' to use the name of the firm in liquidation of 'its past business,' or by the use of any similar expression. The instruction of the trial court was in conflict with the decisions on this question. Besides, it has been held that an indorsement on a note by a firm in liquidation is notice of the dissolution of the firm, which, of course, implies that a partner cannot be held as a partner, under the general law of partnership, for the acts of his former partner. The judgment must be reversed."

CONSIGNMENTS—BILLS OF LADING, WITH DRAFTS.

W, a produce dealer, at Batavia, N. Y., had for several years been in the habit of sending his property to Ege & Otis, commission merchants, New York City, to be sold by them. He consigned the produce and sent to them the original bill of lading; but he took from the railroad company a duplicate bill of lading, to which he attached a draft as against it, and had this draft discounted at a bank in Batavia. The drafts were often drawn without any particular regard to the value of the property described in the bills attached to them. This was the general course of business pursued by all of the parties, consignor, consignees and bank, and was acquiesced in. Between September 29, 1879, and February 18, 1880, W. made 145 consignments and drew 145 drafts; the first 135 drafts amounted to $53,725, were accepted and paid and the entire consignment yielded but $52,065.52. The last ten drafts were not honored, though the duplicate bills of lading were attached to them, and the bank brought an action of conversion for the value of the property represented by the bills of lading, as the consignees had appropriated it to their own use in payment of the overdrafts of the consignee. The bank contended that the consignees had no right to apply the proceeds of the sales of the property sent on these ten bills of lading to the payment of liabilities incured through the acceptance of previous drafts. Plaintiff had judgment in this case—First National Bank of Batavia *vs.* Ege—for the value of the property, and the defendants appealed to the Court of Appeals, of New York, where the judgment was affirmed. The chief justice, Ruger, in the opinion, said: "We think that the contention of the plaintiff is the correct view of the question before us. The practice of carriers in issuing duplicate bills of lading to consignor for property shipped for sale has been much disapproved of by the courts, for the reason that it affords a convenient opportunity for the commission of frauds by consignors, as well as subjecting the carrier to the hazard of making incorrect delivery of the property. No question, however, arises in this case over conflicting claims between holders of respective bills of lading, as there can be no claim that defendants acquired title to the property consigned by virtue of the receipt of any bills by them. The possession of these bills gave defendants no title to the property described therein, but simply conferred the right upon them to receive it from the carrier, and hold it subject to an accounting with the consignor when sold, or to the owner when he should appear. By taking a transfer of a bill of lading from the consignor, and discounting a draft upon the faith thereof, the plaintiff acquired title to the property described therein, to the extent of the draft discounted, paramount to the claims of any other party. This would clearly be so unless such party had in good faith parted with value in reliance upon the possession of the property lawfully acquired. When a consignee of property to sell accepts drafts upon the faith of the consignment, he acquires the right to sell the property, and apply its proceeds in payment of such drafts; but if such proceeds are insufficient for such purpose, he must rely upon the responsibility alone of the drawer to repay any deficiency. By the mere receipt of any subsequent shipment he acquires no lien thereon to the prejudice of those who have advanced money upon them, and taken tranfer of bills of lading to secure such advances."

INDORSER—NOTICE OF PROTEST.

B. sued P. as an indorser upon a promissory note, and the declaration set out that no notice of dishonor was served upon P. upon the failure of the maker of the note to pay, because the note was made for the accommodation of P. A demurrer was filed and overruled in the case—Blenderman *vs.* Price—by the Supreme Court of New Jersey, and Judge Reed, in the opinion, said: "An accommodation note made for the convenience of the indorser, who alone has the interest to pay it, as between himself and the maker, and who must ultimately pay the note, is not entitled to notice of payment."

TRADE FIXTURES—RENEWAL OF LEASE.

A hotel was rented to C. by R. and he occupied it for 12 years, until 1880, when R. gave him notice to quit at the end of the year, but he did not give up the property. He took a written lease for five years, but in it there was no reference made to the fixtures he had put on the place during his tenancy just then expiring. The fixtures were such as are known in law as "trade fixtures." In 1882 C. died and bequeathed his interest in the lease to his wife, who continued the business until the expiration of the term, when she gave up the premises, and was about to remove these "trade fixtures." R. got an injunction to prevent the removal of these fixtures, claiming that they had been abandoned to him on the making of the new lease in 1880, and Mrs. C. carried the case—Carlin *vs.* Ritter—to the Court of Appeals of Maryland, where the judgment was affirmed. Judge Miller, in the opinion, said: "Under the decision it is clear that these fixtures were abandoned to the landlord. A tenant to protect his right to trade fixtures must secure his ownership during his term by removal or agreement."

The property of the Wynn Coke and Mining Company, near Uniontown, Pa., has been levied on by the Sheriff at the suit of the First National Bank of Uniontown on a claim of $4100, money loaned the coke company. Labor claims for unpaid wages to the amount of $1500 have also been filed, while a mortgage appears entered for $9000. The works are near Oliphant furnace and are supposed to be worth $25,000, comprising 85 acres of coal, 75 coke ovens and other property. The trouble was precipitated by the disappearance of A. B. de Saulles, the principal owner of the works.

The Pittsburgh coal operators are now considering the advisability of founding a pool by which retailers can only buy from members, also that all sales be registered at headquarters of the pool, and the latter will practically, like the coke syndicate, now defunct, make all sales.

The Deane Steam Pump Company will supply two pumps, each with a capacity of 2,000,000 gallons in 24 hours, for the seven Hale elevators that are to go into the new Lionberger building at Eighth and Washington avenue, St. Louis, Mo.

TRADE REPORT.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth avenue, PITTSBURGH, Pa., July 2, 1888.

The big lockout of the Iron workers has at last been inaugurated, and, with very few exceptions, the mills not only here in Pittsburgh but in the Ohio, Shenango and Mahoning valleys have been shut down. The Conference Committees had repeated conferences, and strong efforts were made to arrive at an understanding, but without avail; both sides refused to make any material concession, and a shut-down, therefore, was unavoidable. The Iron workers, or at least some of them, appear to be well satisfied with the situation, saying that they have for some years been advocating a vacation of a couple of months during the hot season, and they argue that it will be an advantage to the manufacturers, that it will enable them to work off their surplus stock and obtain better prices. Manufacturers, almost without exception, are determined to have cheaper labor or better prices for their product, even if for a time they do lose some of their trade to Eastern competitors. Pittsburgh manufacturers complain that they have been compelled to pay too much for skilled labor for several years; that they could not successfully compete with Eastern manufacturers who had a decided advantage over them in this respect. Dispatches have been received by mill owners at Youngstown, Ironton, and other points, stating that they also have shut down and will stand firmly with the Pittsburghers. This is perhaps the biggest shut-down ever attempted in this country, and it will be watched with a good deal of interest by business men. The Amalgamated managers appear to have but little doubt but what the manufacturers, after being idle for a time, will become restive at seeing trade going elsewhere, and that they will be ready and willing to accept the scale presented by the Amalgamated Association. The shutdown, it is said, will throw some 14,000 Iron workers out of employment, and will require a good deal of money and heavy assessments to keep up the strike.

Pig Iron.—There is no demand for Mill Irons, nor is it likely that there will be while the lock-out continues; the outlook is very discouraging for furnacemen, and some not already out will blow out their furnaces just as soon as they work what they have on hand. The demand for Bessemer appears to have fallen off, and it is evident that large buyers on the market the past two or three weeks have been supplied; prices, however, are still maintained at the recent advance. We can report a sale of 1000 tons at $17.25, four months, which may be regarded as the milling price for standard brands. Foundry Irons continue dull. Not for many years has the market here been in so bad a condition as at present, and the outlook is not bright for an early improvement. All the Iron taken by the foundries and Steel works is scarcely a drop in the bucket as compared with the consumption of Mill Irons. Mill owners have been buying little or no Iron for some time past, and it is certain, now that their mills are stopped, they will buy none at all. We quote prices as follows:

Neutral Gray Forge	$14 00 @	$14.50,	cash.
All Ore Mill	15.00 @	15.50	"
White and Mottled	13 50 @	14.00	"
No. 1 Foundry	16.50 @	16.75	"
No. 2 Foundry	15.75 @	16.00	"
No. 1 All-Ore Foundry	17.00 @	17.25	"
Charcoal Foundry	22.00 @	24.00	"
Cold Blast Charcoal	25 00 @	28.00	"
Bessemer	17.00 @	17.15	"

Muck Bar—Continues dull and prices are nominal at $26 @ $26.50, cash. There is little or no demand.

Manufactured Iron.—Some mill owners managed to work up a fair stock of Assorted Iron before shutting down, while others were less fortunate. However, as the demand is exceedingly light, it is probable that manufacturers will be able to meet the wants of their customers for some time to come. Prices remain unchanged, and we continue to quote upon a basis of $1.70 @ $1.80 for Bars, 60 days, 2 % off for cash.

Nails. — There is little or no change to note in the Nail market. Trade continues slow and very unsatisfactory, while prices remain unchanged at $1.90 for 12d to 40d in carlots and upward, and 10¢ ₰ keg additional for small lots. It is intimated that the card price is being "cut," but to what extent or whether it is so or not we cannot state.

Wrought Iron Pipe.—Trade has not improved since our last report; if anything, it is growing worse instead of better. But few, if any, of the mills are working up to anything like their full capacity. Some are standing idle. As to prices, they are too unsettled and irregular to quote.

Old Rails—Like Pig Iron, are very dull; demand has been exceedingly light for some time past, and there will be no improvement as long as the mills are standing idle. However, stocks are by no means excessive, and prices remain as last quoted: $21 @ $21.50 for American T's. There is some inquiry for Old Steel Rails, with but few offers.

Steel Rails.—The Edgar Thomson Works are still working full time, and it is said have enough orders booked to keep them going for 60 days. Prices are quoted at $31 @ $31.50, cash, at mill.

Billets, &c.—There is a fair business in Bessemer Steel Billets, which may be quoted at $28, cash, at makers' works in Pittsburgh. Nail Slabs, $27.50 @ $27.75 at makers' works. Sale of Domestic Crop Ends at $17.25, cash.

Merchant Steel.—There was a meeting of the Bessemer Steel men a few days ago, but there was no change made in prices. Tool Steel, 8½¢; Crucible Spring, 4½¢; do. Machinery, 5¢; Open-Hearth Machinery, 5¢. The Steel works of Singer, Nimick & Co., have been closed, the employees refusing to accept a reduction in wages of 10 %.

Railway Track Supplies—Continue dull, while prices remain unchanged: Spikes, 2¢ @ 2.10¢, 30 days, delivered; Spiice Bars, 1.75¢ @ 1.85¢; Track Bolts, 2.85¢ with Square and 2.95¢ with Hexagon Nuts.

Old Material—Of all kinds is dull and prices are weak and in buyers' favor. No. 1 Wrought Scrap, $19 @ $20, net ton; Wrought Turnings, $12 @ $13; Car Axles, $23 @ $24; Cast Scrap, $15 @ $15.50, gross; Cast Borings, $11.50 @ $12; Old Car-Wheels, nominal at $19 @ $20.

Chicago.

Office of *The Iron Age*, 95 and 97 Washington St., CHICAGO, July 2, 1888.

Pig Iron.—The market generally has been inactive, although sales of a considerable quantity of Bessemer and Southern Coke Pig are reported. Less is being heard now of the competition of the cheapest grades of Southern Iron, as the supply has been largely absorbed here and at other centers of consumption. Advices from Cincinnati, privately received, state that fully 20,000 tons more of No. 2 Mill could have been sold there last week if it could have been obtained. The cleaning up of this grade of Iron removes a serious element in the demoralization of prices, and the effect is already seen in several directions. A sale of No. 1 Southern Coke is reported on good authority to have been made at $17.75, cash, f.o.b. Chicago, which indicates a return to better prices. Freight rates on Pig from Southern points were also restored on the 25th ult. to within 15¢ of the rates ruling before the recent cut. Lake Superior Charcoal and Ohio Softeners are not moving freely at present, but inquiries from manufacturers of Agricultural Implements are being received, and it is intimated that the excellent crop prospects will make the demand from this class of consumers heavier than usual. Quotations are as follows, for cash, f.o.b. Chicago: Lake Superior Charcoal, all numbers, $19 @ $19.50; Alabama Car-Wheel, Nos. 1 and 2, $25.25; do., Nos. 3 to 6, $26.25; Southern Charcoal Foundry, No. 1, $18; Jackson County Softeners, No. 1, $17.75 @ $18; Hocking Valley, Soft Foundry, No. 1, $16.50 @ $17.50; American Scotch (Blackband) No. 1, $18.50 @ $19.50; other Ohio Scotch Irons, No. 1, $17.50 @ $18; Lake Superior Coke, No. 1, $17 @ $17.50; No. 2, $16 @ $16.50; No. 3, $15 @ $15.50; Southern Coke, No. 2, $17 @ $17.25; No. 2½ and Open Bright, $16.50; No. 3, $15.50 ; No. 1 Mill, $14.50 @ $15.50.

Bar Iron.—Some of the agricultural implement manufacturers are asking for quotations on a full year's supply, but beyond this nothing has occurred worthy of note. Prices are irregular, with the possibility of a long stoppage of Western mills, and although some brands of Common Iron can be had at 1.60¢, f.o.b. Chicago, half extras, most sellers are quoting 1.62½¢ @ 1.65¢, subject to strike. Prices from store are still 1.70 @ 2¢, according to quantity and quality.

Structural Iron.—The prominent feature of this branch of trade is the increasing number of orders for bridgework, the season now being fairly opened. Beams for building purposes are also selling well in a retail way. Store prices for Angles are: 2.40¢ @ 2.70¢; Tees, 2.60¢ @ 2.90¢; Beams and Channels, 3.80¢. Prices on carload lots from mill, f.o.b. Chicago, are as follows: Angles, 2.12½¢ Universal Plates, 2.17½¢; Tees, 2.42½¢; Beams, 3.40¢.

Plates, Tubes, &c.—The Plate trade has been very satisfactory both in small lots and mill orders. In fact, the business of the entire month has been above complaint, the leading dealers reporting a considerable gain in value, which, of course, means a heavy gain in tonnage over the corresponding month of last year. Prices are strong with an upward tendency, as follows: Heavy Sheets, Nos. 10 to 14. 2.60¢ @ 2.70¢; Tank Iron, 2.50¢ @ 2.60¢; Tank Steel, 2.75¢ @ 3¢; Shell Iron, 3¢; Shell Steel, 3¢ @ 3.25¢; Flange Iron and Steel, 4¢; Fire-Box Steel, 4.75¢ @ 5.75¢; Boiler Rivets, 4¢ @ 4.25¢; Ulster Iron, 3.75¢; Boiler Tubes, 60 % and 10 % off on 2½-inch and larger and 62½ % off on 2-inch and smaller. The low prices on Tubes are attracting buyers and increasing sales are reported, but manufacturers are chary about taking large orders at these rates.

Sheet Iron.—Another week of good business is reported by the agents of such mills as are able to take orders, and they now quote No. 27 Common Black at 2.90¢, f.o.b. Chicago. Store prices are unchanged at 3.30¢ for No. 27. If the Western mills are closed for any considerable length of time by the wages controversy, prices will inevitably advance materially.

Galvanized Iron.—Although the legitimate demand is about the same as it has been, apprehensions of a long stoppage of the mills are causing increased inquiry

from buyers. Manufacturers' agents are, however, in no haste to dispose of their spot stocks and are withdrawing special cash discounts. Small lots are quoted at 60 % and 5 % off for Juniata and 60 % and 10 % off for Charcoal.

Merchant Steel.—Business is quiet, with no change in prices.

Steel Rails.—So far as can be ascertained, no orders of importance have been placed here during the week. Negotiations are pending for round lots with some prospect of an early decision. Orders are known to have gone East recently because deliveries could not be arranged by local mills to suit purchasers. Indications favor an increased business for the fall months, but prices show no improvement. Quotations are still $31.50 @ $32.

Old Rails and Wheels.—Holders of Old Iron Rails are asking $19, but the mills are not inclined to buy with the prospect of a general stoppage of work, so that no transactions are reported. Old Car Wheels are in slight demand at about $19. The only sale coming to light is one of 200 tons by a railroad company direct to a consumer at $18.50.

Scrap.—With very light transactions, quotations are nominal. Mixed Country Scrap is still worth about $12, while dealers' selling quotations range about as follows, ℔ ton of 2000 lb: No. 1 Forge, $17 @ $17.50; Track, $16; No. 1 Mill, $12; Light Wrought, $8.50 @ $9; Horseshoes, $15.50; Axles, $21.50 @ $22; Cast Machinery, $12.50 @ $13; Stove Plate, $9; Cast Borings, $8.25; Wrought Turnings, $9; Axle Turnings, $11; Coil Steel, $13; Leaf Steel, $14; Locomotive Tires, $13.

Hardware.—Jobbers have found the business of the week excellent for the season. All kinds of goods have been in demand, particularly Builders' Hardware. A great deal of building is going on in many of the Northwestern towns. A very heavy business was done in June in Window and Door Fly Screens, exceeding that of any former season. Collections are good, being reported fully up to the average.

Nails.—Manufacturers' agents report the demand slightly reviving, some fair sales having been made during the week to large buyers. Prices have receded a little, Steel Cut Nails now being quoted at $1.90, f.o.b. Chicago, from factory. Jobbers have experienced a very good trade in both Cut and Wire Nails, activity in building causing a demand for quick consumption. They quote small lots at $2.05 @ $2.10 for Steel and $2.50 @ $2.55 for Wire Nails.

Barb Wire.—Jobbers report but light sales, farmers now being actively employed in attending to growing crops and not building fences. They quote small lots at 3¢ @ 3.10¢ for Painted and 3.75¢ for Galvanized.

Forsyth, Hyde & Co., of Chicago, have been appointed sales agents for the Northwest for the Brierfield Iron and Coal Company, of Brierfield, Ala., makers of the Bibb brand of Coke Pig Iron.

The North Chicago Rolling Mill Company, of Chicago and Milwaukee, have issued a very acceptible pamphlet to the Iron trade. It contains 20 pages, is of vest-pocket size, and is covered with heavy paper, having lithographic designs on the front and back. The contents embrace, first, a list of the sizes of Flats, Half Ovals, Half Rounds, Car-Truck Channels, Ovals, Wagon-Box Irons, Rounds, Squares, Car-Link and Car-Tin Irons and Angles rolled at Milwaukee, June 1, 1888; second, the standard list of extras on Bar Iron; third, list of sizes of Steel Plow-Beam Billets, Steel Cultivator Beams, Light Iron and Steel Rails from 8 to 35 pounds, Splices and Bolts, Steel Street Rails, O. G. Tires, Fish Plates, Car Iron, &c., made at Milwaukee; fourth, the Steel classification of extras adopted by the Bessemer Merchant Steel Association, December 1, 1887; fifth, the new national Cut Nail schedule adopted June 6, 1888; sixth, tables showing number of Cut Nails to the pound and lengths of various sizes, tons per mile of Rails of various weights, weight of rolled Iron (round, square and flat), and information regarding railway supplies used in laying track; seventh, description of Bay View Pig Iron. The North Chicago Rolling Mill Company, established in 1857, now have a capital of $6,000,000 and operate blast furnaces and a Steel Rail mill at North Chicago, Ill., blast furnaces and a Steel Rail mill at South Chicago, Ill., and blast furnaces, bar mills, Nail factory, puddle mill and Fish-Plate mill at Milwaukee, Wis., with a total annual capacity of 100,000 tons of Bar Iron and Fish Plates, 400,000 tons of Pig Metal, 350,000 tons of Steel and Iron Rails and 15,000 tons (300,000 kegs) of Nails.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, PA., July 3, 1888.

Pig Iron.—The close of the first half of 1888 shows it to have been a most unsatisfactory one to the makers of Pig Iron. Prices opened at from $20.50 to $21 at tide for No. 1 Foundry, and at about $17 for Gray Forge, drooping from that time to the present without a single reaction, although the most important declines were in May and June. These changes are largely due to a natural reaction from the extraordinary activity of 1886 and 1887, although tariff agitation and the political position generally precludes the possibility of any important ventures being taken up at present. Who, for instance, is willing to take the risk of entering into a large contract, while there is a possibility of foreign material being brought in at several dollars per ton less than American Iron can be made for? Another reason for the steady decline is the encroachments made by Southern and Western Irons. Whatever prices were made for Lehigh or Schuylkill Irons early in the year were almost invariably cut under by furnaces at a distance. Western irons have made the biggest inroads, and are now the most serious competitors owing to their superior quality. Southern Irons were heavily sold earlier in the season, but since the price of Pennsylvania brands have been cut down there is comparatively but little competition, and sales during the past three or four weeks of no importance whatever. It is understood, however, that several new furnaces (Alabama) are to be blown in some time within the next six or eight weeks, and it is therefore not unlikely that a portion of the output will find its way to this market, although to start in with it will have to be at very low prices. It is a peculiar feature that during the earlier periods of manufacture in the South a good deal of the product comes this way, but later on they find a market for it at home, or else displace Iron in the West, which in its turn finds its way into Eastern markets. In regard to the future, the outlook is not such as can be very clearly defined. In some respects there are encouraging features, in others quite the reverse. For several days past the feeling has been gradually veering around toward improvement, and at this writing the tone is hopeful, although somewhat nervous, owing to the uncertainty of things in the West, and in regard to the tariff. On the bright side, we find light stocks, and a demand pretty well up to the current output, very low prices, and prospects that favor expectations of an increasing consumption as the season advances. A large amount of business is said to be waiting for a decision in regard to the tariff, while the ordinary demand promises to be at least equal to that of the first half of the year. The situation in the West is not regarded as likely to be serious, and it is believed that by the middle of the month work will be going on as usual. Assuming that this will be the case, and that tariff matters will also be satisfactorily arranged, the chances seem to favor gradual improvement, while in the event of a change in the administration a decided and marked advance all along the line might very safely be predicted. On the other hand, a protracted suspension of work in the West, or any material changes in the tariff, would be just as certain to act unfavorably on Pig Iron, and more or less demoralize the entire market. So long as these matters are unsettled operations will virtually be kept within the smallest limits possible; and as no human foresight can determine for certain what the outcome will be, it is not to be expected that things can be other than they are—nervous and unsettled. The current output of Pig Iron is estimated to be about 10,000 tons per week less than it was six months ago; and as there are no intimations of any important increase so long as the present low prices rule, stocks will in all probability be kept well under control. The first quarter of the year passed without any quotable change in prices, but toward the end of April a good deal of weakness was manifested, and orders were placed at about 50¢ ℔ ton reduction. By the middle of May the Thomas Iron Company announced $2 reduction on Foundry Irons, since which date, up to about the middle of June, the market was unsettled and weak, but about that time the adjustment of values seemed to be complete and each brand settled to a point beyond which concessions were firmly refused. Since that date to the present the feeling has been of a more settled character, and, in the absence of new elements of disturbance, the general opinion is that the tendency will be slowly, perhaps, but surely, toward improvement. Prices to-day range from $18 to $19 at tide for No. 1 Foundry, $17 @ $17.50 for No. 2, and $15.50 @ $16.50 for Gray Forge, according to brand, quantity, delivery, &c.

Manufactured Iron.—The remarks made in regard to Pig Iron would apply almost equally well under this heading. Prices seemed to have varied with the raw material, being without quotable change during the first three months, but steadily weakening after that up to within about two weeks ago. The falling off in consumption has been very great, compared with either the first half or the last half of the previous year, which statement fully explains the continuons weakness in prices. Each mill naturally tried to run full time, and, in attempts to secure business, prices have been cut almost to the lowest on record. In addition to this, competition from the West has been very strong, and many of the largest orders were carried off, chiefly by Pittsburgh concerns. The result has been unremunerative prices and unwillingness on the part of consumers to take more than small lots at a time, fearing that quotations might go still lower before the reaction came. The falling off in consumption has been largest in Skelp Iron, although the Bar trade has suffered to some extent. Tank Iron, too, has been in very light demand, although Ship Plate and Boiler Iron have in some measure offset the loss, the demand for that class of material having been very satisfactory. But the constant urgency to sell has kept prices at a low point, and if first cost has

been cleared during the past three months it is about all that can be expected. The outlook seems to be a little better at the moment, but until there is some certainty in regard to the outcome of the labor question in the West it is impossible to form any definite opinion on the subject. Meanwhile sellers ask about $1 ℔ ton advance, but would not be likely to accept large orders even then. A general resumption of work in the West, however, would act unfavorably, as buyers easily take fright. A suspension for three or four weeks would probably place things on a firm basis, as the disposition is to take a cheerful view of things, which would be vastly improved providing the pressure to sell was removed for a short time. The highest quotations appear to have been made during January, Bars at 1.95¢; ordinary Plates, 2.15¢ and Grooved Skelp, 1.9¢ @ 1.95¢. During April, May and June Bars sold down to 1.8¢ @ 1.85¢; Plates to 2¢ and Skelp to 1.8¢, although in many instances even the lowest figures were shaded in special transactions. At this writing, owing to so many mills being closed, asking prices are firmer at 1.85¢ @ 1.9¢ for Bars; 1.85¢ for Skelp and 2¢ @ 2.1¢ for Plates, but the feeling, for reasons already stated, is nervous and unsettled.

Steel Rails.—The Steel Rail market has been so thoroughly discussed in our New York reports that there is but little to be said at this time. Sales to date for the year are estimated to be about 900,000 tons, which, in round numbers, represents a falling off in sales of about 750,000 tons for the six months, as compared with 1887. Prices average from $8 to $9 ℔ ton lower than they were at this date a year ago, and about $2 lower than they were six months ago, quotations being $38 @ $39 in July, 1887, $32 in January and $30 to-day. The outlook for the next six months is not encouraging as regards Rails, although the increasing demand for Steel in other forms is an important offset to the shrinkage in the Rail trade.

Old Rails.—It would be hard to find a period in which so little business was done and with so few changes in prices as during the past six months. They were quoted $21 @ $22 for T's six months ago, and are nominally the same to-day, a few unimportant transactions having been made during the period under review at $20.50 @ $20.75, most of the sales having been at $21 @ $22. The supply is light and the demand equally so, and at the moment there are no indications of change either for higher or lower figures.

Wrought-Iron Pipe.—During the past six months demand has not been up to expectations and prices have been very disappointing. The year 1887 was remarkable for the very large trade in this particular line. Natural gas companies were the largest consumers, and the mills were unable to turn out the stock fast enough, being compelled to work day and night a great part of the time. Prices, too, were held without much difficulty, and in giving an order the buyer was more particular as to time of delivery than to price, generally leaving the mill to arrange the latter. Since the first of the year, however, trade has been quite the reverse of 1887. Demand has gradually fallen off and prices weakened accordingly. Orders received from the natural gas companies are in some cases probably 50 % less than they were a year ago, while several new mills have been erected, adding largely to the productive capacity, and to secure trade these new comers were compelled to cut prices. Add to this the unsatisfactory condition of the Iron trade in general and the natural result is light demand and uncertain prices.

Chattanooga.

Office of *The Iron Age*, Ninth and Carter Sts., CHATTANOOGA, TENN., July 2, 1888.

Pig Iron.—The condition of the market remains about the same as last reports and is far from being on a satisfactory basis. Prices are very irregular, and so far as making any quotations are concerned, that is entirely out of the question. Some of the new furnaces are making sales of large lots at outrageously low prices, which must certainly be below cost, and they are making contracts for future deliveries extending far toward the close of the year about on the same basis. On the other hand, most of the old plants are under contract for nearly all of their product. These contracts were made when Iron was much higher than it is now, and, of course, these furnaces are running along quite regardless of the fall in prices. The general opinion seems to prevail that there will be no change for the better until the policy of the general Government on the tariff question becomes more settled, which, of course, cannot be determined during the present year. In addition to this come the anticipated strikes of the workers of Pig Iron and the hot weather of midsummer, during which many of the mills suspend operations, strike or no strike. As yet we do not hear that any of the Southern stacks contemplate blowing out, nor even those that are in course of construction suspending operations, but they are pushing their work forward as fast as possible. There appears to be no doubt, however, but what the present year will develop those that have the longest purses, as well as those that can make Pig Iron the cheapest. Freights remain unchanged since the last deal, $2.25 to Cincinnati and Louisville and $3 to St. Louis from this point.

Louisville.

LOUISVILLE, KY., July 2, 1888.

Pig Iron.—There has been no decline in the market since last report. Indications report steady buying at present prices. If it was not expected that several new furnaces would be offering their Iron during July, prices would slightly advance, as the older furnaces are largely sold ahead, and are only offering small lots of off-colored Irons. Buyers continue to make inquiries for deliveries running throughout the year and in some instances for 12 months, and sales have been made on this basis. Among the new furnaces, the DeBardeleben, Pioneer, Sheffield and Nashville are placing their Irons on the market, and their product is spoken of with favor. It is expected that No. 1 of the Sheffield and Birmingham Coal, Iron and Railroad Company's furnaces will be in blast next week, to be followed by No. 2 and No. 3 during the next 60 days. It is thought their Iron will be a most excellent one, as the Ore used is brown, and a portion of their coke will be Pocahontas, whose excellent qualities are well known. Some of the furnacemen think that the continued inquiry on the part of buyers for large quantities of Iron for future delivery indicates that the market will not go much lower, and they are hopeful that the worst has been reached. Advices from the East point to a slight improvement in that direction. Old Material, which is largely used by Rolling mills here, is weak, owing to the threatened shutting down of the works on account of the strike with the employees.

Southern Coke, No. 1 Foundry	$16.00 @	$17.00
" No. 2 "	15.00 @	16.00
" No. 2½ "	14.50 @	15.00
Hanging Rock Coke, No. 1 Foundry	16.50 @	17.00
Hanging Rock Charcoal, No. 1 Foundry	20.25 @	22.25
Southern Charcoal, No. 1 Foundry	17.25 @	17.75
Silver Gray, different grades	13.25 @	14.25
Southern Coke, No. 1 Mill, Neutral	12.75 @	13.75
" No. 2 " "	12.25 @	13.25
" No. 1 " Cold Short	12.25 @	13.25
Southern Charcoal, No. 1 Mill	13.25 @	14.75
White and Mottled, different grades	12.00 @	12.50
Southern Car-Wheel, standard brands	21.50 @	24.50
Southern Car-Wheel other brands	18.50 @	20.50
Hanging Rock, Cold Blast	22.50 @	24.50
Hanging Rock, Warm Blast	18.50 @	19.50

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, July 2, 1888.

Pig Iron.—There has been a larger inquiry for Pig Iron during the week under review, and the aggregate sales for June are quite large. The tonnage for the month, as a local firm puts it, with Western dealers, is probably the heaviest of any month this year. Large buyers of Pig Iron apparently realize the weight of the arguments advanced in support of higher prices before many weeks, but the average consumer has exhibited no confidence as yet in a recovery of the market. The demand during the past week for round amounts of Pig Mill Iron for late delivery has demonstrated the fact that Southern furnaces are really sold largely ahead, the would-be buyers being unable to make contracts for large amounts for such deliveries as they desired. It production is increasing in the South so is consumption, and the decline in stocks is good evidence that the market is working into a better condition. There is considerable Mill Iron still available for immediate delivery, but the market is well cleared of foundry grades. It is also very difficult to place orders for Car-Wheel Iron either for present or future delivery. Among the sales effected during the week were 4000 tons No. 1 Mill at $14.25, for delivery during the entire year; 5000 tons Gray Forge at $13.25, and between 3000 and 4000 tons mixed grades, Mill and Silvery Iron, at $13.50 ℔ ton. Moderate sales of No. 2 Foundry have been made at $15.50; No. 2½ do., at $15; 1000 tons Bessemer at equivalent to $17.70 ℔ ton here, and about 500 tons Southern Car-Wheel at $25 ℔ ton, cash. Prices current here, cash, f.o.b., are approximately as follows:

Hot-Blast Foundry.		
Southern Coke, No. 1	$16.50 @	$17.00
Southern Coke, No. 2	15.50 @	16.00
Southern Coke, No. 3	15.00 @	15.50
Ohio Soft Stone Coal, No. 1	17.00 @	17.50
Ohio Soft Stone Coal, No. 2	15.00 @	15.50
Mahoning and Shenango Valley	16.50 @	17.00
Hanging Rock Charcoal, No. 1	20.50 @	22.50
Hanging Rock Charcoal, No. 2	19.00 @	21.00
Tennessee and Alabama Charcoal, No. 1	17.50 @	18.00
Tennessee and Alabama Charcoal, No 2	16.50 @	17.50
Forge.		
Strong Neutral Coke	13.50 @	14.00
Mottled Neutral Coke	12.50 @	13.00
No. 1 Mill Coke	13.50 @	14.00
No. 2 Mill Coke	13.00 @	....
Car-Wheel and Malleable Irons.		
Southern Car-Wheel	20.00 @	23.00
Hanging Rock, Cold Blast	22.00 @	25.00
Lake Superior Car-Wheel and Malleable	21.00 @	22.00

Manufactured Iron.—The manufacturers and Iron workers have failed to come to an agreement for the ensuing year, and the result will be idleness at the mills for a longer or shorter time. The Amalgamated Association demands a renewal of last year's scale, while manufacturers propose a reduction. The lull at the mills may help the market for the manufactured product, which is still dull and easy, with prices nominal. Bar and Sheet Iron—Common Bar Iron, 1.90¢ @ 2¢; Charcoal Bar Iron, 2.90¢ @ 3¢; Sheet Iron, Boiled, Nos. 10 to 27, 2.50¢ @ 3.25¢; Sheet Iron, Charcoal, Nos. 15 to 25, 3½¢ @ 4½¢ ℔ lb.

Nails.—The demand has been only moderate and an easier tone has prevailed, with lower prices ruling. Quotations are based upon 12d @ 40d, which sell at $2 ℔ keg, with 10¢ rebate in carload lots at mills; 50d @ 60d, 25¢; 10d, 10¢; 8d @ 9d,

25¢; 6d @ 7d, 40¢; 4d @ 5d, 60¢; 3d, $1, and 2d $1.50 per keg more. Steel Nails sell at $2, and Steel Wire Nails at $2.65 @ $2.75 ℔ keg.

Old Material.—The market has been quiet, but steady under moderate offerings and small sales of Old Wheels at $19 @ $19.50. Old Rails are wanted at $20, cash, here.

New York.

Office of *The Iron Age*, 66 and 68 Duane St., NEW YORK, July 3, 1888.

American Pig.—Very little business has been done during the past week, and no movement of any consequence is expected in the near future. During the week another striking case has come up illustrating the injury which some sellers of Southern Iron are doing to themselves and principals. A leading foundry up the Hudson River contracted for the delivery of a 1000-ton lot of Southern Foundry Iron some months past. They finally received 250 tons and were unable to get the balance, so that they were finally forced to go into the open market to cover their requirements. The Southern furnaces seem to be willing to book any amount of orders "subject to furnace maker," knowing that they cannot by any possibility fill them all. Such methods are trying to all parties concerned, and are injurious to the best interests of merchants and manufacturers. They should make arrangements to provide against delays in the delivery of Iron. Even now the cotton season is approaching and it looks as though the experience of past years of having large quantities of Iron wanted by consumers lying quietly for months at Savannah will be repeated. We quote for standard and choice Northern Irons, tidewater delivery, $17.50 @ $18.50 for No. 1 Foundry, $16.50 @ $17.50 for No. 2 Foundry and $15 @ $16 for Gray Forge. The strike in the Western mills has little effect upon this market, which is insignificant so far as Mill Pig is concerned.

Scotch Pig. — We quote: Coltness, $19.50 @ $20: Summerlee, $19.50 @ $19.75; Langloan, $19 @ $19.50, and Dalmellington, $18 @ $18.25.

Spiegeleisen.—The market is very dull, with reports of offers to sell German Spiegel at $26 on cars Jersey City, while English is held at $27 @ $27.25.

Bar Iron.—As yet no serious effect upon prices has been caused by the lockout in the Western mills, though their withdrawal from Eastern markets, which they have helped to demoralize, is likely to cause a better feeling. It is believed, however, that the closing down will not extend beyond July. We quote carload lots, on dock, half extras, Common Iron, 1.6¢ @ 1.65¢; Medium, 1.65¢ @ 1.7¢, and Refined, 1.75¢ @ 1.8¢.

Structural Iron.—We quote: Bridge Plates, 1.95¢ @ 2¢; Angles, 2¢ @ 2.2¢; Tees, 2.5¢ @ 2.7¢; Channels and Beams, 3.3¢, on dock.

Plates.—We quote: Tank, 1.9¢ @ 2¢; Shell, 2.15¢ @ 2.30¢; Steel Tank, 2.4¢ @ 2.15¢; Shell, 2.15¢ @ 2.25¢; Flange, 2.6¢ @ 2.75¢, and Fire-Box, 3¢ @ 3.25¢.

Steel Rails.—In the East the market is very quiet, and business has been confined to small lots, and inquiries are confined to a few round lots, up to 5000 to 10,000, for early fall delivery. With Rails selling at $31 at Chicago, which is equivalent to $27.75 at Eastern mills, the latter are practically confined to the East and South. In the West more business is reported, one mill having closed 23,000 tons in 70 days, while another is reported as having taken one large contract. Even there, however, little business is in sight. We quote nominally $30 for moderate lots at Eastern mills.

Wire Rods.—Only a few small sales have been made at $40 @ $40.50, which we quote.

Old Rails.—No business of any consequence is reported, and we continue to quote $20 @ $20.50 nominally for T's.

Fastenings.—Spikes are $2 @ $2.05, and Angle Bars, 1.85¢ @ $1.9¢ delivered.

Financial.

Business everywhere is quiet but hopeful. A central point of interest just now, that which affords the most reason for apprehension, is the outcome of labor questions among the iron-workers of Pennsylvania and the West. In another quarter much interest is excited by the action of Judge Brewer in granting an order temporarily restraining the promulgation of the reduced railroad tariff in Iowa pending argument for an injunction. The cutting of rates on the trunk lines causes general demoralization east of Chicago.

The Stock Exchange markets remain as for some weeks past, dull and uninteresting, aside from the severe cutting of rates between rival lines of transportation and the prospect of a legal contest in the United States Court to determine the powers of State Railroad Commissioners in fixing tariffs. As has been truly remarked, the situation is peculiar, inasmuch as under the Interstate law the companies cannot form a pool, and differentials having failed, there is no known remedy for the difficulty.

Government bonds are quoted as follows:

U. S. 4½s, 1891, Registered.....	107¼ @ 107½
U. S. 4½s, 1891, coupon.....	107¼ @ 107½
U. S. 4s, 1907, registered	127⅛ @ 127⅝
U. S. 4s, 1907, coupon.....	127⅛ @ 127⅝
U. S. Currency 6s, 1895..	119 @ ...

A sample of new crop amber wheat from Ohio was shown on the Produce Exchange on Saturday by J. J. Blackman & Co. The quality of the wheat was exceptionally fine, and would weigh 61 to 62 lb to the bushel. The weather during the past week has been favorable for all growing crops in the wheat, corn and tobacco regions of Ohio, the Upper Mississippi and Missouri valleys and Tennessee. The State Board of Agriculture of Illinois state that there has been a decided improvement in the condition of the crops of that State. The condition of winter wheat in the central counties gives encouragement for about an average yield. Winter-wheat harvest is well advanced in the southern counties. The prospect of the corn crop is better.

The official crop report of Colorado shows that alfalfa is the leading crop, being represented by 250,000 acres, while corn has an acreage of 225,000 and oats of 200,000. A dispatch received in this city from London reports India wheat seriously damaged by drought. Speaking of the wheat harvest now in progress the San Francisco papers remark: "The result up to the present has been an agreeable disappointment to those who looked for very short crops."

The weekly bank statement shows comparatively slight changes in specie and legal tenders. The combined loss of these, which constitute the total reserve, is only $304,700, but the surplus reserve is down, due to an expansion of $3,278,300 in loans, which is the only striking feature of the exhibit. The banks have increased their loans within a month over $13,500,000, probably due to preparations to meet July obligations. The banks now hold $26,-817,225 in excess of the 25 % legal requirements, against $3,651,075 last year and $11,021,450 in 1886. The Treasury payments for interest and bonds purchased will further augment the bank reserves in the near future. The effect of the preparations incident to the July disbursements has been so slight as to be almost imperceptible. Call loans are still quoted at 1 % @ 2 %, and time loans at 2 % @ 3½%, according to the period for which they run and the kind of collateral offered. A feature of the market was the placing of some $5,000,000 Canadian funds for six months at 3 % and under. This sum was a part of the proceeds of the loan recently negotiated abroad by the Dominion of Canada, but in excess of immediate requirements. Prime mercantile paper passed as low as 3½ %, but the running rates were 4 % @ 5 %. The exports of specie during the week were unimportant, scarcely exceeding $200,000.

The weekly statement of bond purchases is as follows: Amount purchased of 4 per cents, $18,383,300; amount purchased of 4½ per cents, $8,393,050; total, $26,776,-850; cost of 4 per cents, $23,347,744.20; cost of 4½ per cents, $9,039,056.20; total, $32,386,800.40; cost at maturity, 4 per cents, $32,539,326; cost at maturity, 4½ per cents, $9,705,158.31; total, $42,244,-584.31; saving on 4 per cents, $9,191,-581.80; saving on 4½ per cents, $666,-102.11; total, $9,857,683.91. The Commissioner of Internal Revenue estimates the total receipts from internal taxes during the fiscal year just closed to be $124,500,000. This is an increase of nearly six millions over the receipts of last year and an increase of $4,500,000 over the Commissioner's estimate at the beginning of the year. The receipts from Customs will probably not exceed greatly the receipts of last year. For the entire fiscal year ended June 30, 1887, they were $217,286,893. The estimated reduction in the public debt for the month of June is $14,429,502, and for the year $113,900,-000, against $109,707,646 for the fiscal year ended June 30, 1887.

The imports of merchandise at this port during the week were valued at $9,000,000, of which $2,000,000 represents dry goods. Since January 1 the total is $240,157,000, as compared with $236,015,000 during the same time last year. The exports were $4,726,647.

There were 182 more mercantile failures in the United States during the last six months than there were during the first half of last year, and the increase in the liabilities of those who failed in the first quarter of the present year was about $5,000,000. *Bradstreet's*, which supplies these figures, attributes the increase mainly to cotton speculation, a bank failure and "dry rot" in several old business houses. For the second quarter the increase of liabilities is about $6,000,000, attributed largely to the failure of the American Exchange in Europe, of a large dry goods house, a whisky house and a tea firm. Assets, however, amounted to 53 % of liabilities, as against 48 % one year ago.

The assessed valuation of real estate in New York City for 1888 is $1,302,818,879; increase over last year, $48,327,080, equal to 3.85 %.

There was a decrease yesterday of 5¢ in the East-bound rate on agricultural implements from Chicago.

The foreign exchange market is again firmer, and on Monday the rate was advanced ¼ to $4.87½ @ $4.89.

In coffee and cotton there has been unusual speculative interest, Rio advancing in a single day 9¢ per pound, the widest fluctuation known in the history of the Exchange, and dealings in cotton were larger than for a long time past, though at a lower range, cash cotton declining $\frac{3}{16}$¢ ℔ lb. Raw sugars were strong, with an active demand from refineries. No small degree of interest attaches to the decision of the Attorney-General of this State to inquire judicially into the combination commonly known as the Sugar Trust, and it is surmised that proceedings will commence without delay. Nothing further

has transpired concerning the threatened boycott of non-union refineries in Philadelphia. In wheat there is a firmer feeling, in consequence of a better export demand. Corn and oats advanced slightly in sympathy with wheat. Provisions are dull and easy. The dullness long observed in manufactures of wool begins to be felt in cotton goods. For most descriptions of staple groceries quotations are firm. Prices of anthracite coal are well maintained under a restricted production.

The city of Providence, R. I., has established a bank clearing house. There are 34 banks that have associated themselves with the new organization and two trust companies.

Metal Market.

Copper.—Chili Bars opened in London on Thursday of last week at £81. 2/6, spot, and improved 2/6, but the advance was lost subsequently, and they again came £81. 5/ yesterday, while futures maintained the 5/ gained, coming £78. 10/ yesterday. The total sales did not exceed 225 tons. In our own market Copper was devoid of anything doing to speak of, spot and July ranging between 16½¢ and 16.60¢, nominally; August at 16.45¢, September and October at 16.40¢ @ 16.45¢, down to 15.90¢ bid. In the London market spot Chili Bars remain steady to-day at £81. 5/, while futures have given way 10/, being called £78. Our own market is absolutely stagnant to-day at nominally 16.50¢ @ 16.60¢ spot Lake. It was cabled from London since our last report that the French syndicate has made a contract with two of the leading Copper mines in Japan, representing seven-eighths of the total output of that country, for their product during three years. On the Paris Stock Exchange Rio Tinto shares declined last week 8¾ francs.

Tin.—Spot Tin opened last Thursday in London at £75. 2/6, and futures at £75. 10/, but the former the next day improved to £75. 5/, the latter remaining steady, sales amounting to 160 tons, while here the dull state of affairs continued, spot being offered at 17.05¢, while 16.80¢ was bid, June at 17¼¢, with 16½¢ bid; July and August at 17.05¢, with 16.95¢ bid, and 70 tons, August, sold at the latter figure, after 45 tons had been done at 16.85¢ on Thursday. This week opened in London under more favorable auspices, 220 tons being sold yesterday, and the quotation for spot coming 7/6 higher, at £75. 12/6, while futures improved 15/, to £76. 5/. The improvement on the other side was responded to in our own market by an advance, 145 tons being sold at 17.25¢ @ 17.55¢ for August, 17.25¢ for July, and 17.45¢ @ 17.50¢ for October. London this morning opens at a further improvement of 5/, futures as well as spot, the latter being worth £75. 17/6 and the former £76. 10/. The cause of the buoyancy has to be searched for in the favorable statistics disclosed by the figuring up on the 1st inst. The deliveries in London and Holland reached last month no less than 4268 tons, against 1999 in June, 1887, and 1835 in June, 1886, reducing the visible supply in Europe and America, July 1, to 20,403 tons, as compared with 16,092 tons same time last year, and 10,871 on July 1, 1886. *Tin Plates.*—Stocks continue light, which helps to sustain the price for spot lots. Considerable concessions can be had for future delivery. The demand is only moderate for the latter, as well as for spot Plates. We quote at the close, large lines, on the spot: Siemens-Martin Steel, Charcoal finish, $5 @ $5.25; ditto Coke finish, $4.80; Ternes, $4.30 @ $4.40; Bessemer Cokes, $4.50 @ $4.60, and Wasters, $4.35 @ $4.40. Coke Tins are selling at 12/9 in Liverpool, for prompt delivery.

Lead.—Consumers took during the week under review 300 tons of Common Domestic Lead in the open market at 3.80¢ @ 3.85¢, but the price to-day is 3.90¢. They all complain of a dull trade and serious falling off in the demand. Meanwhile London has been improving, and Soft Spanish is cabled £12. 10/, which is a 2/6 advance since our last. But even at this advance it can be laid down in New York in bond at 2¾¢. Lead sales at the Metal Exchange embraced on Thursday last 178 tons at 3.80¢ @ 3.82½¢, spot, 3.87½¢ @ 3.95¢, July and 4.05¢, August; on Friday 400 tons at 3.95¢ @ 3.97½¢, July, 4¢ @ 4.05¢, August, and 4.05¢ September; yesterday 500 tons brought 4¢ @ 4.02½¢ on the spot, 3.95¢ @ 3.97½¢ for July, 3.90¢ @ 3.95¢ for August, and 4.02½¢ @ 4.05¢ for September.

Spelter and Zinc.—Common Domestic Spelter does not bring over 4½¢, ordinary brands, just at present, the demand for the week having been insignificant, while Silesian may be quoted 5¢ @ 5½¢. The course of the market here would improve if the lockout in the Iron regions were avoided, as a good demand for Galvanizing might then possibly set in. While this question remains in abeyance not much of a revival need be looked for. In Europe a further improvement in Lead might start an upward movement in Spelter again, as the two metals usually go together on the Continent.

Antimony.—Nothing of interest has occurred. The demand is moderate, but steady, at 13¼¢ @ 13½¢ Cookson, and 10¼ @ 10½¢ Hallett.

New York Metal Exchange.

The following sales are reported:

THURSDAY, June 28.

16 tons Lead, spot	3.80¢
16 tons Lead, spot	3.82½¢
16 tons Lead, July	3.87½¢
16 tons Lead, July	3.92½¢
16 tons Lead, July	3.95¢
40 tons Tin, August	16.85¢
50 tons Lead, August	4.05¢
48 tons Lead, July	3.92½¢
16 tons Lead, July	3.92½¢

FRIDAY, June 29.

25,000 lb Copper, October	16.40¢
96 tons Lead, July	3.97½¢
50 tons Lead, August	4.05¢
16 tons Lead, July	3.97½¢
16 tons Lead, July	3.95¢
16 tons Lead, August	4.02½¢
16 tons Lead, August	4.00¢
16 tons Lead, August	4.02¢
100 tons Lead, August	4.02½¢
32 tons Lead, August	4.00¢
50 tons Lead, September	4.05¢
100 tons Lead, August	4.00¢

MONDAY, July 2.

10 tons Tin, August	17.35¢
10 tons Tin, August	17.30¢
60 tons Tin, October	17.50¢
10 tons Tin, October	17.45¢
250 tons Lead, August	3.95¢
16 tons Lead, August	3.92½¢
16 tons Lead, August	3.90¢
(Sellers right to double.)	
16 tons Lead, August	3.90¢
(Sellers right to double.)	
16 tons Lead, September	4.05¢
100 tons Lead, September	4.02½¢
32 tons Lead, September	4.00¢
10 tons Tin, August	17.30¢
20 tons Tin, July	17.25¢
16 tons Lead, spot	4.00¢
16 tons Lead, spot	4.02½¢
16 tons Lead, July	3.97½¢
16 tons Lead, July	3.95¢
16 tons Lead, July	3.97½¢
25 tons Tin, August	17.25¢

TUESDAY, July 3

32,500 lb Lead, September (sellers' right to double)	4 07½¢

Coal Market.

The Anthracite Coal trade is reported to be in excellent condition, free from labor troubles, and with prices well maintained. The Coal sent to market during the year, to date, is 15,695,759 tons, against 15,238,579 tons for the same period last year. Quotations are as follows: Wyoming Free Burning, f.o.b. at South Amboy and Weehawken, Broken or Grate, $3.75; Egg, $4; Stove and Chestnut, $4.25; Reading Hard White Ash, at Port Elizabeth, Lump and Steamboat, $4.25; Broken, $4; Egg, $4.10; Stove, $4.25; Chestnut, $4.15; Pea, $3. Free burning White Ash is the same, except Broken, $3.75, and Egg, $4. Lehigh Coals are: For Lump, $4.50 Broken, $4.20; Egg, Stove and Chestnut, $4.10 ℔ ton, f.o.b. at the loading ports.

A tacit understanding exists all round that about July 15 prices of Anthracite will be advanced 15¢ @ 25¢ ℔ ton, or an average of about 20¢. In the absence of any formal announcement to this effect the proposed advance is referred to as bearing the stamp of authority.

The Bituminous trade is dull and sales are heard of as low as $2.90 alongside. Comparatively little is doing excepting in deliveries on old agreements.

Imports.

The imports of Iron and Steel, Hardware, &c., at this port from June 18 to June 28, inclusive, and from January 1 to June 28, inclusive, were as follows:

Iron and Steel.

	June 18 to June 28. Tons.	Jan. 1 to June 28. Tons.
Iron Ore: R. De Flores	988	5,205
Pig Iron: Naylor & Co	480	3 190
Crocker Bros	400	5,460
G. W. Stetson & Co	300	10,700
N. S. Bartlett	200	3,000
Jas. Williamson & Co	200	2,500
A. Milne & Co	105	859
Henderson Bros	100	1,175
Jas. Lee & Co	25	325
Spiegeleisen: Naylor & Co	1,069	4,379
Crocker Bros	63	1,566
Steel: W. F. Wagner	58	759
J. Abbott & Co	21	250
R. H. Wolff & Co	16	260
Pierson & Co	12	26
N. Cohn & Co	13	142
A. Milne & Co	11	947
C. Hugill	9	150½
F. S. Pilditch	7	245
Montgomery & Co	7	48
Thos. Prosser & Son	7	16
C. W. Power	7	41
H. W. Belcher	5	5
C. F. Boker	4	111½
J. G. Wilson	3	7
R. F. Downing & Co	1½	167½
Steel Rods: Naylor & Co	1,517	11,000
R. H. Wolff & Co	310	2,310
J. A. Roebling's Sons	214	1,155
J. Abbott & Co	145	3,509
R. F. Downing & Co	51	156
Dana & Co.	26	531
Cary & Moen	23	527
Montgomery & Co.	12	60
Iron: J. Abbott & Co	180½	1,345½
G. Lundberg	150	150
R. F. Downing & Co	5	5
Steel Sheets: R. Crooks & Co	11	225
Steel Billets: Naylor & Co	519	2,264
J. Abbott & Co	167	1,117
J. A. Roebling's Sons	126	370
A. Milne & Co	50	359
Steel Plates: Naylor & Co	50	167
Hondolette & D	20	80
H. Crooks & Co	5	670
Steel Hoops: A. R. Whitney & Co	100	1,705
Steel Bars: R. H. Wolff & Co	15	19
Naylor & Co	10	371
C. S. Mersick & C &	5	191
Steel Forgings: Thos. Prosser & Son	170	2,579
Steel Crop Ends: Naylor & Co	780	1,020
Steel Wire: J. A. Roebling's Sons	38	115
Steel Tubes: J. S. Leng's Sons	11	35
Steel Rails: St. Paul, M. & C. R. R. Co	598	598
Scrap Steel: A. Milne & Co	7	57
Rivet Rods: J. Abbott & Co	397	1,904
J. A. Roebling's Sons	253	417
Iron Rods: J. Abbott & Co	15	192
Sheet Iron: T. B. Coddington & Co	60	743
Nail Rods: J. Abbott & Co	169	274
Channel Bars: J. G. Wilson	98	98
Wells, Fargo & Co	6	6
Iron Girders: Peter Wright & Sons	24	24
Iron Beams: R. F. Downing & Co	45	165
W. H. Wallace & Co	41	211
Cotton Ties: Naylor & Co	1,400	1,400
Swede Iron: A. Milne & Co	253	253
Old Rails: Perry & Ryer	100	100

Tin Plates.

	Boxes.	Boxes.
Phelps, Dodge & Co	16,981	239,238
Dickerson, Van Dusen & Co	7,941	135,797
T. B. Coddington & Co	5,723	79,948
Hy. Whittemore & Co	4,000	37,895
Pratt Mfg. Company	3,798	82,439
Wolff & Roesing	2,667	17,274
N. L. Cort & Co	1,617	55,368
A. A. Thomsen & Co	1,800	54,465
Lombard, Ayres & Co	1,000	4,744
R. Crooks & Co	917	86,803
H. R. DeMilt & Co	853	7,128

Merchant & Co	843	6,176
Bruce & Cook	1,424	46,322
Central Stamping Company	478	13,150
Iron Clad Mfg. Company	38	119
	Boxes.	Boxes.
Taggers Tin: Phelps, Dodge & Co	258	505
Hy. Whittemore & Co	250	500

Metals.

	Pounds.	Pounds.
Tin: Muller, Schall & Co	1,766,123	4,800,507
Naylor & Co	202,131	1,117,244
Hendricks Bros	28,884	264,464
Knauth, W. & Kuhne	22,400	22,400
F. Nauman	3,000	3,000
Spelter: Thos. J. Pope's Sons & Co	56 000	56,000
American Metal Company	22,398	410,179
Old Brass: Lawrence, Johnston & Co	9,221	17.693
Sheet Zinc: A. Milne & Co	2,205	2,205
Lead: N. Corwith & Co	222,842	222.842
E. A. Caswell	91,574	91,574
Antimony: Edward Hill's Son & Co	200	975
American Metal Company	25	95

Hardware, Machinery, &c.

Boker, Hermann & Co., Mdse., cs., 11
Baldwin & Co., Mach'y., case, 1
Barbour Bros. & Co., Mach'y., pkgs., 36
Brown, Geo. W., Mach'y., box 1
Cotter & Company, mach'y., pkgs, 19
Erie Dispatch Company, Mach'y., pkgs., 3
Field, Alfred & Co., Anvils, 135
Goodwin, R. J. & Son, Wire Plate, cks, 5
Graef Cutlery Company, Cutlery, cs., 6
Hartley & Graham, Mdse., cs, 11
Hurst, F. W. J., Mach'y., pkgs., 4
Jimines, Haustedt & Co., Mach'., pcs., 2
Lafferty, R. B., Mach'y., pkgs., 3
Meacham Arms Company, Mdse., cs., 8
Merchants' Dispatch Company, Chains, cks., 23
Rott, C., Mach'y., crates, 3
Schoverling, A., Mdse., cs., 22
Schoverling, Daly & Gales, Mdse., cs., 25
Scoville Mfg. Company, Mdse., cs., 14
Ward, Asline, Mdse., cs., 8
Wiebusch & Hilger, Chains, cks, 26; Mdse., cs., 2
Witte, John G. & Bro., Cutlery, cs., 14
Order: Machinery, cs., 2

Irons and Metals Warehoused from June 18 to June 28, Inclusive.

	Pounds.
Spelter: Lewisohn Bros	44,092

Exports of Metals.

	June 18 to June 28. Pounds.	Jan. 1. to June 28. Pounds.
Copper: J. Abbott & Co	771 621	5,934,795
Lewisohn Bros		3.879,022
F. A Lomal		2,581,293
American Metal Co	268,800	4,342 453
G. H. Nichols		223,939
J. Bruce Ismay		112,000
S. Mendel		560,000
Ledoux & Co		110,376
Phelps, Dodge & Co		230.664
Muller, Schall & Co		430,000
Copper Queen Con. M. Co		224,034
J. Kennedy, Tod & Co		112.026
H. Becker & Co		1,250
Orford C. & S. Rfg. Co		224.881
Robt. M. Thompson		125,000
Thos. J. Pope, Sons & Co		765,880
J. Parsons & Co		67,500
Bridgeport Copper Co		112,000
C. Herold		250,000
Phelps Bros		6,250
R. W. Jones		189,984
Copper Matte: Williams & Terhune	887,489	28,621,256
Lewisohn Bros		3,021,610
American Metal Company	227,408	1,272,563
J. Abbott & Co		295,060
C. Ledoux & Co		458,800
F. W. J. Hurst		184,288
G. H. Nichols		722,777
H. T. Nichols & Co		180,995
Old Brass: Burgass & Co	14,812	212.098
Old Copper: Burgass & Co	67,721	461,953

Old Metals, Rags, &c.

The purchasing prices offered by dealers are as follows:

Heavy Copper	$0.10 @	$0.07
Light Copper	... @	.07
Copper Bottoms	... @	.07
Brass, Heavy	... @	.05
Brass, Light	... @	.05
Composition	... @	.10
Lead, Heavy	... @	.03½
Tea Lead	... @	3.00
Zinc	.02 @	.03½
Wrought Iron	16.00 @	...
Light Iron	8.50 @	...
Stove Plate Iron	9.50 @	...
Machinery Iron	13.00 @	...
Grate Bars	@	5.00
Old Rubber Springs	.04½ @	.05
Old Rubber Shoes	... @	.01½
White No. 1	.03¾ @	.04
White No. 2	.01⅝ @	.01¾
Canvas, Linen, No. 1	.04 @	.04½
Canvas, Cotton, No. 1	.04¾ @	.04½
Canvas, No. 2	.03⅝ @	.02½
Seconds	.01 @	.01½
Soft Woolens	.06½ @	.07
Mixed Rags	.01 @	.01¼
Gunny Bagging, No. 1	.02 @	.02½
Jute Butts	.02 @	.02½
Book Stock	.01¼ @	.01⅝
Newspapers	.00⅞ @	.01⅛
Waste Paper	.00¼ @	.00½
Hemp Twine	.03 @	.03¼
Sisal Baling Rope	... @	.03½

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, TUESDAY, July 3, 1888.

There is still a more or less unsettled feeling in the markets for Block Tin and Copper. The syndicate doings are carefully hidden and outside speculative holders do not appear to be very enthusiastic. It is the belief that a large portion of the syndicate Tin is still unsold and the impression obtains that that interest would be the first to meet any improvement in the demand. However, the fact that the Chinese dealers in the Straits have stored metal in considerable quantities at primary points instead of selling at late current prices leads to a belief that support may be looked for in that quarter. Trading has been more active the past two days and purchases for cornering of "short" sales gave prices a turn for the better. There is a large quantity of high-priced Copper held in this market by outside speculators, and, in view of the fact that no opportunity has been afforded for satisfactory reselling, it is thought that forced realizations will soon be in order. The business in Refined Copper, Sheets, &c., is still very much restricted, and an undercurrent of weakness is apparent that contrasts with the seeming firmness of Chili Bars. The Associated Smelters have lowered their price for Best Selected to £78, but outside lots are £1. 6/ @ £2 below that and difficult to sell. Sheets have also been reduced, and the nominal prices are now £6 below those current last month. There is some uncertainty as to whether the reductions made were wholly on the manufacturers' own responsibility or agreed to by the syndicate. In either event revision has no favorable bearing upon the market for Chili Bars. The visible supply in Europe is stated at 72,000 tons, against 52,000 tons a year ago, but the amount of Copper "in sight" does not cover the entire stock. The syndicate hold no less than 65,000 tons foreign, besides about 20,000 tons English. It is stated that a considerable quantity of outside Copper and Furnace Material has been purchased recently for syndicate account, and that interest is thought to have more complete control now than heretofore. Regarding contracts made by the syndicate for Japanese Copper, reference to which was made in a previous report, the following particulars are given: The contracts call for 9000 tons out of the annual production of about 10,500 tons, and run one year, with the option of being renewed, for similar quantity, for a series of years ahead.

The Tin Plate Market has undergone very little change, and that little is certainly not for the better. As a matter of fact the demand has dropped off considerably, while some makers have named very low prices as a means of drawing in orders for future delivery. This weakness is partially due to increased production, as well as moderate demand. Richard Thomas, London, has purchased the Melin-Griffiths plate works for £12,000.

The Clyde shipbuilders have secured large contracts recently, and this together with a good demand for railway supplies has caused quite a brisk demand for Steel of nearly all descriptions. The sale is reported of a cargo of Blooms for shipment to Boston from the Tees, the first American transaction in a long time. The Ebbw Vale Company have secured an order for 11,000 tons Steel Rails for a Portuguese railway. The price is not stated. Their Staffordshire ironworks are being put in readiness for restarting.

Beyond some hardening of prices of Hematite, due probably to the renewed activity in the Steel trade, there has been no material change in the Pig Iron markets. Middlesboro' Pig barely holds its own, and Scotch staggers under the weight of heavy surplus stocks, the amount in Connal's stores being now 1,000,000 tons. There has been a little "spurt" in warrants, due to covering by speculators.

A meeting of the creditors of Stevenson Jaques, Middlesboro', has been held, at which a report was submitted showing liability £42,000, and assets £13,000.

There has been a "strike" at the West Cumberland Steel Works, and the workmen are all out.

Scotch Pig.—A fair volume of business and prices steady for most brands.

No. 1 Coltness, f.o.b.	Glasgow		47/
No. 1 Summerlee, "	"		46/6
No. 1 Gartsherrie, "	"		44/6
No. 1 Langloan, "	"		44/3
No. 1 Carnbroe, "	"		39/
No. 1 Shotts, "	at Leith		45/
No. 1 Glengarnock, "	Ardrossan		43/
No. 1 Dalmellington, "	"		39/6
No. 1 Eglinton "	"		38/

Steamer freights, Glasgow to New York, 5/; Liverpool to New York, 7/6.

Cleveland Pig.—Prices firmly held, but business moderate. No. 1 Middlesboro', G.M.B., 34/; No. 3 do., 31/6.

Bessemer Pig.—The market very steady, with a good business passing. West Coast brands, mixed numbers, 42/6, f.o.b. shipping point.

Spiegeleisen.—Demand continues good, and prices are very firm. English 20 % quoted 80/, f.o.b. N. W. England shipping point.

Steel Rails.—The market steady, and demand fairly active. Standard sections quoted at £3. 17/, f.o.b. at N. W. England shipping point. Middlesboro' district about 2/6 @ 5/ less.

Steel Blooms.—Rather quieter, but steady. We quote at £3. 13/6 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—A good business at slightly lower prices. Bessemer, 2½ x 2½ inch, £3. 17/6, f.o.b. at N. W. England shipping point.

Steel Slabs.—Demand moderate. Prices barely steady. Bessemer, £3. 18/6, f.o.b. at N. W. England shipping point.

Steel Wire Rods.—Quiet market and prices easier. Mild Steel No. 6 quoted at £5. 16/3 and No. 5 at £5. 12/6, f.o.b. at N. W. England shipping point.

Old Rails.—Demand still light and prices weaker. Tees quoted at £2. 15/ @ £2. 17/6, and Double Heads £2. 17/6 @ £3, c.i.f., New York.

Scrap Iron.—Market dull and rather weak. Heavy Wrought at £2. 5/ @ £2. 7/6, f.o.b.

Crop Ends.—Demand slow and prices nominal. Bessemer quoted £2. 5/ @ £2. 7/6, f.o.b.

Tin Plate.—Only a moderate trade and prices barely steady. We quote, f.o.b. Liverpool:

IC Charcoal, Allaway grade	14/9 @ 15/
IC Bessemer steel, Coke finish	12/9 @ 13/
IC Siemens " " "	13/3 @ 13/6
IC Coke, B. V. grade	12/9 @ 13/
Charcoal, Terne, Dean grade	12/6 @ 12/9

Manufactured Iron.—A firmer tone to the market, but business not brisk. We quote, f.o.b. Liverpool:

	£	s. d.		£	s. d.
Staff. Ord. Marked Bars			@	7 10	0
" Common "	4	17 6	@	5 0	0
" Bl'k Sheet, singles			@	6 10	0
Welsh Bars (f.o.b. Wales)	4	12 6	@	4 15	0

Tin.—Irregular market, more active trading. Straits quoted at £76 @ £76. 5/ spot, and £76. 5/ @ £76. 10/ for three months' futures.

Copper.—Trading moderate; market barely steady. Chili Bars closed at £81. 2/6 @ £81. 5/, spot, and £78, three months' futures. Best Selected, £79, nominal

Lead.—More doing and the market firmer. Soft Spanish, £12. 7/6 @ £12. 10/ at the close.

Spelter.—Quiet market and prices still in buyers' favor. Silesian, ordinary, £14. 15/ @ £15 at the close.

Hardware.

The month opens with a moderate demand, and a market in which prices are, as a rule, unchanged. Some quotations are, however, being revised, and lower prices in special lines are ruling, but the prices of goods generally continue as before.

Nails.

The New York market continues very quiet, as is natural during the present season. A number of mills throughout Eastern Pennsylvania have closed down during the hot weather. We quote carload lots on dock $1.90 to $1.95, and smaller lots from store $1.95 to $2.

R. H. Johnson, who is connected as secretary with the Wire Nail, Wire, Iron Rope and Bessemer Steel Association, has issued a circular containing proposals looking toward putting the Cut-Nail trade on a sounder basis. His plan is to allot percentages to the mills monthly, on the basis of estimated consumption, the mills not knowing until the end of the month what their allotment has been, the whole quantity being based upon the number of machines. If a mill exceeds its allotment it pays a fixed sum into the treasury, from which those draw allowances who have not made as much as their allotment. It is stated that all of the Wheeling mills have signed and that all but two of the leading works west of the Allegheny Mountains have agreed to the scheme. A commissioner located at Chicago is to take charge of the allotment of production, the mills managing their own affairs in other respects. Mr. Johnson has already made approaches to some of the leading Eastern interests. Whether or not the scheme can be carried through remains to be seen. Past efforts in this direction have been anything but encouraging.

Wire Nails.

The market is without material change, prices being irregular and low, $2.50 being named as the carload price at factory, and small lots from store selling at $2.60 to $2.70.

With reference to the condition of the Wire Nail market we have the following from a well-known manufacturer:

It is perhaps too old a story to say to you that Wire Nails are selling very much less than cost, and we yet find an unfeeling public slow to believe that this is true. The fact, however, remains that prices are such that they must be speedily disastrous to a large amount of capital and to a great many people who have ventured into this industry. In spite of this state of things, however, your paper often gives glowing accounts of a new concern started in some community where people have not yet had their fingers burned. Confiding stockholders are going to learn something in the next two or three years.

Barb Wire.

The market is sluggish with a small demand. Prices are to a large extent nominal, being quoted at 4 cents for carload lots and 4.30 cents for small lots from store. It is probable that these prices could be slightly shaded.

Ammunition.

The Ammunition market to a casual observer continues in about the condition it has been for several weeks, there being no obvious change in the situation. The offering of Cartridges by the E. C. Meacham Arms Company, at cut prices still continues, and they are unquestionably supplying a good many goods, and to a considerable extent annoying their competitors and the manufacturers, and thus demoralizing the market. Most of their sales are to the small trade at but a slight concession from regular prices, their policy apparently being to sell Ammunition in St. Louis at New York prices, a thing which, by the rules of the association, their competitors, who are loyal to the association, are not permitted to do. At the same time the Meacham Company are making some sales at lower prices to the larger trade, but a desire to keep their stock from becoming exhausted makes them exceedingly cautious in so disposing of their goods, especially in view of the policy of the association, to which we have before referred, of having the goods purchased in their interest for the purpose of exhausting the supply.

While the Meacham Company are thus shrewdly and persistently carrying on their part in the contest it must be borne in mind that the association are doing all that they can to keep the market regular, and to prevent the Meacham Company from obtaining goods. As there is reason to believe that the company's stock is being replenished from time to time, the association are using due diligence to ascertain the sources of supply, and to prevent the furnishing of the goods. With a view to accomplishing this they have been adopting measures to induce the Special and the A houses to adhere closely to the letter and spirit of their contracts, so as to prevent irregularities as far as possible. The requirement of a monthly affidavit exceedingly sweeping in its scope went into effect last January, but, not satisfied with this, it is reported that efforts have been made in some cases to obtain additional affidavits. This policy has not, however, in all cases resulted as desired, having been met by a refusal to give other affidavits than those called for in the terms of the contract. It is also generally understood that special pains have been taken to get information in regard to the sales made by houses between whom and the Meacham Company it was thought that there might have been some kind of an understanding, and it is intimated, apparently on good ground, that "spotters" or detectives have been employed with more or less freedom to ascertain the source or destination of goods.

The result of this action has probably been to a certain degree successful, as the association have made it somewhat more difficult than it has heretofore been for the trade to purchase Ammunition at irregular prices. For some time, as our readers are aware, there had been in a very quiet and confidential way a great deal of irregularity in the prices at which Cartridges have been sold, many of the trade who purchased in considerable quantities being able to get in an indirect way concessions from the regular price. To such an extent has this irregularity been carried that it has been estimated by a well-informed party in this line that a comparatively insignificant portion of the Cartridges consumed were free from irregularity in price somewhere between the factory and the counter. While it is probable that the manufacturers have succeeded in slightly checking this tendency, our advices are to the effect that the irregularity continues without substantial abatement, and that buyers can still in many cases obtain concessions, as the association are apparently finding much difficulty in regaining or holding their control of prices.

While their effort in this direction may have been attended by a measure of success, it is undoubtedly the case that the trade while inclined to acquiesce in a system which would give them a handsome profit in handling goods are disposed to be restless under the restrictions which the association places upon them, and it is thought not unlikely, if the manufacturers continue drawing the cords more tightly, that the large trade will become restive, and protest against what they regard as arbitrary dictation. The requirement of the affidavit in regard to Cartridge sales is regarded as especially obnoxious. The disfavor with which pools and combinations are held by the trade, and the satisfaction taken by many merchants in circumventing them, is also an unobserved but potent factor in the situation.

While there are rumors in regard to the formation of a new Cartridge company in which the Meacham Company will be interested, the question of the ability of the latter to obtain goods during the next few months is one of especial importance. The general opinion is that they will be able in one way or another to obtain such Cartridges as they may require for sale to the small trade at the slightly cut prices which it is their policy to make, and that they will thus continue to cause more or less irregularity in the market. In the meantime trade is exceedingly quiet, there being a widespread feeling that there may be a reduction in prices. In these circumstances it is maintained by many that it would be the part of wisdom for the association to make some terms with the Meacham Company if this were found to be feasible. Of their willingness to do this, however, the association give no intimation, and, if they should do it, it would be regarded by the trade as an evidence of weakness. It remains to be seen what further action they will take with a view to improving a situation unsatisfactory both to them and to the trade at large.

Miscellaneous Prices.

The following is the price list of the Champion Safety Lock and Novelty Company, Cleveland, Ohio, to whose Side Window and Meeting-Rail Window Sash Locks we have before alluded. The list prices are subject to a discount of 60 per cent.:

The Champion Safety Side Window Sash Locks and Fasteners Combined.

No.		Per doz.
10,	Malleable Iron, Bronzed	$1.20
12,	Malleable Iron, Polished Face, Bronzed,	1.40
15,	Malleable Iron, Bronzed, Nickel-plated face	1.80
18,	Malleable Iron, Plain, Bronze-plated	1.75
20,	Bronze Metal, Plain	3.50
25,	Bronze Metal, No. 4 Finish	3.50
28,	Bronze Metal, Nickel-plated	3.60

The Champion Safety Meeting-Rail Window Sash Locks.

No.		Per doz.
103.	Iron, Bronzed	$1.25
105,	Iron, Bronzed, with Bronze Metal Lever	2.00
107,	Iron, No 1 Finish	2.25
109,	Iron, Polished and Bronze-plated	4.25
110,	Iron, Plain, Polished and Bronze-plated	4.50
111,	Real Bronze Metal, No. 1 Finish	7.00
113,	Real Bronze Metal, No. 3 Finish	7.00
115,	Real Bronze Metal, Plain Finish	7.50
117,	Real Bronze Metal, Nickel-plated	9.00
119,	Real Bronze Metal, Plain Finish, Large Size	17.00

The following prices on Clothes Wringers, Mangles, &c., are announced by the Lovell Mfg. Company, Erie, Pa. The following is their Clothes Wringer list, which is subject to a discount of $2.50 per dozen; terms f.o.b. Erie, net 60 days, 2 per cent. discount for cash in 10 days:

Clothes Wringers.

	Per doz.
No. XX, Invincible, with Rowell gears	$36.00
No. 11, Princess Bench Wringer, with Rowell gears	39.00
No. 10, New Princess, with Rowell gears	27.00
No. 2½, Princess, with Rowell gears	27.00
No. 1½, Princess, without gears	25.50
No. 2, Phœnix, with cogs	27.00
No. 1, Phœnix, without cogs	25.50
No. 2, Old Reliable	22.50
No. 3, Old Reliable	27.00

Their Clothes Mangles, Folding Wash Benches, &c., are sold as follows, terms f.o.b., net 60 days, 2 per cent discount for cash in 10 days:

Clothes Mangles.

	Per doz.
Economist Mangle	$69.00

Terms, f.o.b. Erie; net 60 days; 2 per cent. off 10 days.

Folding Wash Bench.

	Per doz.
Folding Wash Bench	$12.00
Folding Wash Bench, with Wringer stand	15.00

The Stanley Rule and Level Company make no changes in their prices or discounts on July 1. They have added one quite novel tool to their line of specialties, a description of which will be found in our columns, page . This tool has been christened Odd Jobs, as indicating by the name its many uses. The manufacturer's price is 75 cents each, with a discount to dealers of 20 and 10 per cent.

A slight advance has been made by the associated manufacturers in the price of Wringers. Instead of the abatement from list of January 10 of $3, as heretofore, it is now $2.50; terms, f.o.b., 60 days, with 2 per cent. discount for cash in 10 days.

Door Locks do not show any evidence of improvement, but are apparently in a worse condition than for some time. Net prices representing exceptionally low quotations are more frequently made and a disposition is shown by the manufacturers to induce sales by offering low prices.

Padlocks are somewhat weaker in price, quotations made during the last season being now slightly shaded.

Since our last report the market for Wrought-Iron Pipe has shown no further settling, the low prices then referred to still continuing. At present quotations it is thought by well-informed parties that Pipe would be a safe purchase, as it is not likely to go much lower and will probably in the near future be held at somewhat higher figures.

At the meeting of the manufacturers of Squares held last week it was found impracticable to continue the control of prices, and the market is now an open one. As a consequence materially lower quotations than have prevailed for some time are now made, and this line of goods is regarded as somewhat demoralized.

Bright Wire Goods are also in an unsettled condition and lower quotations are made. The competition in this line is animated, and it is intimated that it is not probable that there will be a material improvement immediately.

A reduction has been made in the prices of Cast Butts, which are now quoted at discount 70 and 10, with only a small extra to the large buyers. The destruction of the works of the Reading Hardware Company, referred to in another column, may have some effect in strengthening the market, as the production of goods is thus for a time materially diminished.

The new prices for Carriage Bolts have gone into effect and the action of the manufacturers is generally regarded with satisfaction. The regularity that is thus promised in this line, with the reasonable prices established, apparently meets the approval of the trade.

The Philadelphia Pattern Carriage Bolt market is reported to be unsettled and weak, and some low quotations have been made. It remains to be seen whether or no it will be feasible to correct this condition of things.

Machine Bolts and Bolt Ends are also offered at slightly lower prices with only a moderate demand.

Items.

The Atha Tool Company, of Newark, N. J., for whom C. H. Gurney & Co., of Chicago, are general Western agents, have issued a new illustrated catalogue and price list of the steel tools which they manufacture, embracing Adzes, Axes, Chisels, Hammers, &c. It is a book of 146 pages, bound in cloth, with heavy boards and beveled edges and is a most excellent specimen of fine printing and engraving. The peculiar trade-mark of the company occupies a conspicuous position. It consists of a capital A inclosed in a horseshoe, on which the name of the company curves round the toe. The official Steel classification is printed in full on the closing pages of the catalogue.

The catalogue and price list of J. H. Sternbergh & Son, the Reading Bolt and Nut Works, Reading, Pa., is elegantly printed in red and black on paper of exceptionally fine quality. It represents the varied line of goods which they are manufacturing, with list prices revised to date. They also call attention to their machinery for Bolt and Nut manufacturers and state that they are prepared to manufacture Bolt heading, pointing and threading machines, shears for cutting blanks, Hot-Pressed Nut machines and Nut-tapping machines, of which they make several sizes of each, adapted to all classes of work.

We regret to have to announce the destruction of the works of the Reading Hardware Company, Reading, Pa., by a fire which occurred last evening. The fire originated in the polishing department which occupied a central position in the extensive plant, whence it spread rapidly to other buildings, so that in a short time the entire works, with the exception of one foundry, were completely destroyed. The parts burned included the pattern shops, the warehouses, the polishing and nickel-plating departments, packing department, the engine and boiler houses, the japanning and finishing departments and the offices. These buildings contained a great quantity of valuable machinery, patterns, materials and finished goods and the loss is estimated at from $250,000 to $350,000.

In the list of the associated manufacturers of Carriage Bolts which was given in our last issue the address of the Anderson Bolt Company was erroneously given as Indianapolis, Ind. It should have been the Anderson Bolt Works, Anderson, Ind. Their card emphasizes the fact that they use natural gas, and refers to Common Carriage Bolts, Machine Bolts, Lag Screws, Bolt Ends, Bridge Bolts and Hot-Pressed Nuts as manufactured by them.

A recent transfer of property and change of business in which the Buffalo Wire Drawing Company are concerned has been given publicity in the daily press of that city. We are desired to state that the Buffalo Wire Works, Scheeler & Sons, are not connected with the above company, as might possibly be inferred from the similarity of names.

J. H. Sternbergh & Son, Reading, Pa., are sending out nickel-plated Hexagon Nuts which are intended for use as paper weights. While they serve this purpose admirably they are also utilized in calling attention to their manufactures of Bolts, Nuts, Rivets, Washers, Iron, &c.

Elsbre & Mix, Sherburne, N. Y., have transferred their stock and business to a new firm, Conley & Ingham, who will carry it on at the old stand.

The Keokuk Novelty Company, Keokuk, Iowa, C. H. C. Burlingame, president, issue a circular describing their Sure Shut Spring Hinge, the advantages of which are pointed out.

Porter & Wooster, 66 and 68 Beverly street, Boston, Mass., so long and favorably known throughout the country as manufacturers of Carriage Hardware Specialties, dissolved partnership July 1. Both partners will continue business at their present location, Mr. Porter manufacturing the Easy Bolt Clipper, and Mr. Wooster manufacturing the other goods heretofore made by the firm, with the exception of Body Corner Irons. This branch of their business has been sold to C. Cowles & Co., New Haven, Conn. The firm is referred to as having been successful, and in this new departure the partners are regarded as having excellent prospects.

The Pennsylvania Bolt and Nut Company, Lebanon, Pa., for whom Topping & Fox, 96 Chambers street, New York, are agents, have issued an illustrated catt alogue and price list in which they exhibithe line of Bolts, Bolt Ends, Lag Screws, Nuts, Washers, Turn Buckles, Forgings, Boiler and Bridge Rivets, &c., of which they are manufacturers. A full-page illustration is given of the extensive works of the company.

We are advised by Quernheim & Heckell St. Louis, Mo., that they are general agents for the Moser Bundle and Package Carrier, manufactured by the Moser Holder Company, Belleville, Ill., and that they are prepared to negotiate with responsible parties for the exclusive sale of these goods in their respective cities. Hibbard, Spencer, Bartlett & Co., Chicago, Ill., are referred to as having the exclusive sale of these goods for that city.

Hartley & Graham, 17 and 19 Maiden Lane, New York, announce that they are prepared to furnish the trade with improved quality Shot Shells of the Union Metallic Cartridge Company, packed in new boxes with fancy lithographed labels, samples of which are at the same time sent out. These new labels are attractively printed with appropriate illustrations.

The Francis Axe Company, Buffalo, N. Y., in their advertisement, occupying page 62, call attention to the All Steel Axes, illustrating also some specialties. The trade will observe that it is intimated that special rates will be made for immediate orders to be shipped by September 1.

Nimick & Brittan Mfg. Co., Pittsburgh, Pa., send out a circular of the House Automatic Liquid Door Check and Spring, which they are now manufacturing. Illustrations are given explaining this article and pointing out its utility. The House Liquid Door Check and Buffer is also shown.

W. B. Belknap & Co., Louisville, Ky., under date July 2, issue in a four-page circular the new cards for Cut and Wire Nails, with a table giving the length and thickness of the latter. In the circular to the trade these Nails are referred to as having been often characterized as the Nail of the past and the Nail of the future respectively, but are stated to be to them the Nail of the present, as large stocks of both are carried.

Recknagel & Co., 106 Broad street, New York, send out a circular relating to the Cataract Washing Machine, for which they are agents. It gives a description of the machine, pointing out its special features. That the interior of the machine is free from bolts, screws, nuts, rivets or anything liable to tear the clothes is emphasized. This machine has been offered to a limited extent and this house is now preparing to put it on the market more generally.

The Philadelphia Milk Shaker Mfg. Company, corner Thirteenth and Buttonwood streets, Philadelphia, Pa., issue a circular describing the Milk Shaker which they are manufacturing, and also an Ice Shaver.

The E. S. Greeley Company, 5 and 7 Dey street, New York, issue a circular relating to Tamer's Patent Telephone Attachment, which is for the purpose of increasing the distinctness with which a Telephone is heard, preventing the rattling of the trans-

mitter diaphragm, &c. They also issue a leaflet in which the Electricians' Pocket Tool is illustrated. This article comprises a Birmingham Wire Gauge, the French millimeter and English inch comparative Scales, Screw Driver, Wire Cleaner, Pencil Sharpener and a Wrench.

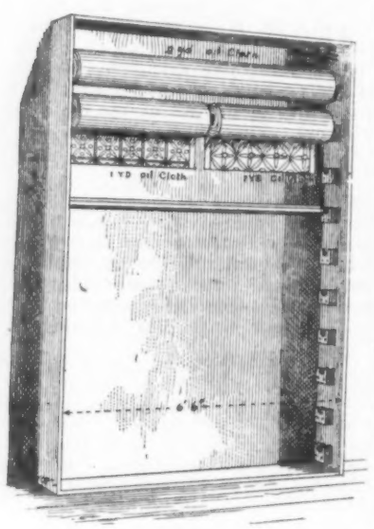
The Union Indurated Fibre Company, 37 Barclay street, New York, are sending out a circular relating to Paper Bags, which they are offering at low figures. These Bags are made by the well-known firm of L. Waterbury & Co., and have on them an advertisement of Indurated Fiber Ware, in which the advantage of this Ware over ordinary Woodenware is pointed out. These Bags are furnished at the following prices with the company's advertisement on :

2 pound standard	$1.25 per 1000
4 pound standard	1.80 per 1000
2 pound special	1.00 per 1000
4 pound special	1.45 per 1000

They will add a merchant's card not exceeding three lines at slight additional cost.

Convenient Store Fixtures.

In our issue of several weeks since we briefly called the attention of our readers to some of the methods employed by Mr.



Convenient Store Fixtures.—Fig. 243.—Oil Cloth Rack.

Charles W. Davis, of Wabash, Ind., in the arrangement of his stock of shelf hardware, &c., and referred among other things to various devices used in the display of his goods. Supplementing what

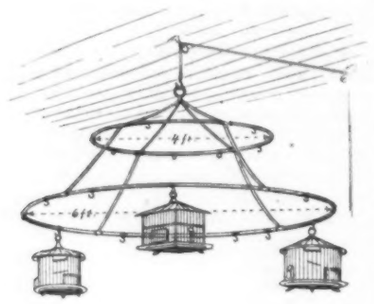


Fig. 244.—Gas-Pipe Rack for Cages.

then appeared, we present by means of the accompanying illustrations several views of the devices referred to. In Fig. 243 we show a rack adapted for the display of floor oilcloth, which is of a sufficient width to receive one roll of eight-quarter or two rolls of four-quarter cloth. The rack is described as being set in the shelving, and is 6 feet 6 inches wide, 12 feet high and 12 inches deep, made of 2-inch poplar. It is provided with a series of rolls, octagonal in shape, placed 10 inches

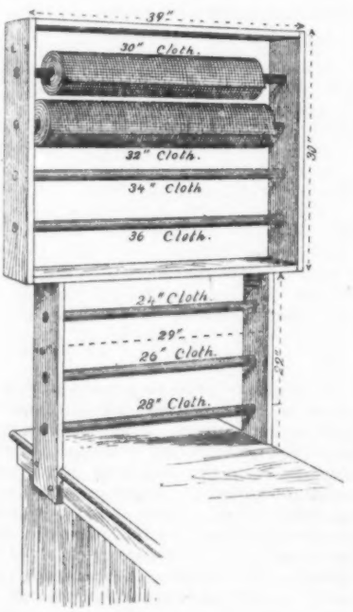


Fig. 245.—Rack for Wire Screen Cloth.

apart, or a sufficient distance to allow of a full roll of oilcloth or linoleum. The rolls are 2½ x 2½ inches. Mr. Davis informs us that this rack may be placed on the wall at the end of the shelving or be built in the shelving, as may be preferred, and extended upward to the ceiling. The general arrangement of the rack, with several rolls of oilcloth in position, is shown in Fig. 243. In Fig. 244 is shown a bird cage rack made of gas-pipe. It is composed, as will be seen from an inspection of the engraving, of two rings, the upper one being 4 feet in diameter, while the lower

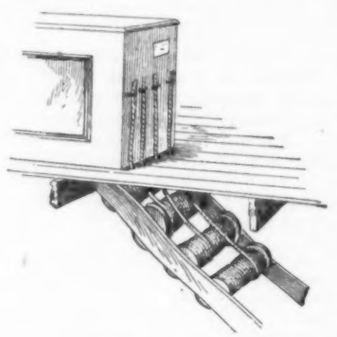


Fig. 246.—Rack Showing Method of Handling Rope.

one has a diameter of 6 feet. The two rings are connected by means of gas-pipe, which renders the rack firm and durable. It is suspended by means of a chain which runs over double pulleys to the side of the room and then down within convenient distance from the floor. This enables the cage to be readily lowered for the purpose of examining the goods suspended from it. It has a capacity for 30 cages. In Fig. 245 of the illustrations is shown a perspective view of the rack employed by Mr. Davis for holding wire-screen cloth. As will be noticed, the standards supporting the lower section are fastened to the sides of the counter in such a way that the cloth may be easily unrolled and measured upon the counter. The rolls upon which the wire cloth is placed are 1½ inch in diameter, and upon each end is placed a tin cap, fastened to the roll by means of a single screw. The lower section of the rack admits of rolls of cloth 24, 26 and 28 inches in length, while the upper section has a capacity for 30, 32, 34 and 36 inch cloth. Fig. 246 of the illustrations shows the method of handling ropes adopted by Mr. Davis. The rack is placed in the cellar at such an inclination with the ceiling that the coils of rope do

Fig. 247.—Wire Catch for Holding End of Rope.

not interfere with one another. The end of the rope from each roll is passed up through holes in the floor and fastened to the end of the counter by means of a catch made of No. 12 spring wire. An enlarged view of this catch is shown in Fig. 247 of the illustrations. At the end of the counter and just above the ends of the rope is placed a sheet giving the weights and number of feet to the pound of the various sizes of rope in stock. All the goods upon the shelves are protected from dust by doors hung to narrow strips, with parliament butts, the whole being painted red. The method of showing samples adopted by Mr. Davis is to hang or screw them fast in front of the same goods found upon the shelves. By this means all the shelving space can be used to advantage, and permits of the goods being kept in original packages.

Movable Fronts for Stores.

An improvement in shop fronts was patented in this country not long since by John Gooch, of Brompton Road, London, Middlesex County, England. Patents on the same improvement have likewise been issued in Great Britain, France, Belgium, Norway, Germany, Sweden, Canada, Italy, Victoria, Tasmania, New Zealand, South Australia, Spain, New South Wales, Austro-Hungary, Queensland and India. It is evident from this impressive list of countries in which the invention has been secured that the author of the idea has faith in its utility and also in its general adoption by the business public. The improvement relates to those stores or shops in which the lower floor is used for business purposes and the stories above for residence. The object is to provide means by which the whole extent of the frontage between the side walls during business hours can be rendered available and used for the display of goods and for business purposes in general, and by which a side or private entrance can be provided when the store is closed. The invention consists essentially in features of construction of the shop front. The show windows and store entrance are adjustable relatively to other parts. During business hours the movable front part or parts are separated one from the other so as to open up an entrance to the store from the front, presenting at this time the conventional store with show windows at the sides and door in the middle. When this entrance is closed up by the reverse movement of the parts, the private entrance or entrances to the house as the case may be are brought into use. As a rule, where buildings are put up for the combined purpose of a store on the first floor and residence above, the latter connecting with the front by stairs, or with residence in the rear of the store,

communicating with the front by a side hall, it is necessary to sacrifice a portion of the width of the store, more particularly of the show windows. This invention proposes to utilize the entire front for show window and entrance purposes in business hours, and yet have the private entrance available for all other times. In the patent drawings mentioned one view shows a store front occupying the entire width of the building in business hours and showing two private entrances when the store is closed, and provided with a sliding or rolling blind adapted to come down to cover the entire store front when the private entrances are employed.

Business Methods.

A neat and effective method of bringing goods to the attention of the consumers is adopted by Hoopes, Brother & Darlington, Westchester, Pa., in a dainty pamphlet devoted to their Warner Wheel. As it may be suggestive to manufacturers or merchants in other lines we reproduce its substance below. The front cover contains the words, "For the man whose business it is to buy your wagons." The Warner Wheel is then referred to in the following terms:

Our Warner Wheel is never to fail at the weakest spot in other wheels. But what if it does?

Exact from your wagon-maker the bargain we make with him—new wheels for old if they fail at the hub, with no limit of time or anything else but unworkmanlike work on the wagon-maker's part.—See postscript.

It is better to make this guarantee through your wagon-maker. We make it to him; and he makes it to you. For we deal with him; and he deals with you.

We make, as most wheel-makers do, four grades of wheels, alike except the wood they are made of. We have to, besides, to humor the wagon-makers—there are just as many grades of wagon-makers as there are of wheels.

The best of oak and hickory grows in this part of the United States; but there is oak and oak, and hickory and hickory. Out of the self-same log are brittle and middling and good and tougher than steel.

There isn't nearly enough tough wood in the world to make the wheels all tough. There isn't any need of all the wheels being tough. Why tough wheels for a tender wagon? and most of the wagons are tender.

But, after a wheel is painted and varnished, who can tell the brittle wood from the tough till it breaks?

So go to the wagon-maker who, you judge—but make him prove it—will give you the best of wood in your wheels; then make him repeat our guarantee.

Most wheel-makers make four grades of wheels, we said; but they don't all use the same marks. Our marks have always been XX for best, X for next best, No 1 for next, No. 2 for next lowest—the worst we burn. But some of the makers mark their wheels XXXX, XXX, XX and X. Don't let those extra X's make you think their wheels are better than ours.

Half the wheels we make go to London and Paris. They are finding out on the other side where the best materials come from.

Now and then a Yankee imports a French or English wagon and gets our wheels. Two freights and a duty! No matter; salt water and a little jingle of silver don't hurt 'em. Such wheels are worth paying for.

The necessary cost of our wheels is very little more than that of the next-best make, whatever that make may be. But what do you think of a method of making that makes the weakest spot in a wheel the strongest? If the argument is as good as the wheel, you will want our wheels.

POSTSCRIPT.—We make this limit to our guarantee, if it is a limit: If a wagon-maker bores a hub for too large a box, he must take the risk, not we; the same if he puts on too light a wheel for the axle. These are what we mean by unworkmanlike wagon-maker's work.

This limit is proper for us, not for the wagon-maker. He can give you a still stronger guarantee. We take the risk of our wheels. Let him take the risk of his work in addition.

But the owner must keep his tires tight. It would be absurd to guarantee a wheel with the tires neglected.

Uniformity in Marking Goods.

A correspondent takes up the subject of uniformity in marking goods, and presents the following views:

Do those of your readers who are engaged in the sale of shelf goods extensively think of the great importance of system an uuniformity in putting prices on such goods as tinware, wooden ware and general stock of housekeepers' articles? Is it not too true that much is left for guesswork, and the fact that a dinner-pail is generally sold for 25 cents fixes that as the figure until a competitor has made an advance or a cut in the price? Suppose they cost $1.75 per dozen, and the dealer has adopted a general rule to add 50 per cent. profit on tinware. The pail would then be marked 22 cents, but nine out of ten would mark it either 20 cents or 25 cents, to make it "even figures." The trouble growing out of a lack of uniformity is that a part of the dealers charge 20 cents and a part 25 cents, and no one knows until he loses sales that he is charging too much. I am going to advocate a cast-iron rule of fixing a profit on all lines of goods and then marking them to the nearest figure, leaving out fractions. If it is 25 per cent. on wooden ware, and the dealer buys a lot of pails for $2.25 per dozen, they will retail for 28 cents. On cutlery he thinks 33⅓ per cent. profit right, and a set of knives that cost 88 cents should be marked at $1.17 per set—no more and no less.

Another mistake made by many dealers is to mark goods after looking at them and estimating what they will bring. A dealer thinks a bread or cake box looks big for its cost and will mark 75 cents for one that costs 35 cents. Here he is all at sea again—no rule or system, and the competitor that has a rule, and sells the cake box for 53 cents gets his full and fair profit, and a customer for future purchases. Many dealers are too much engaged in their financial and other office work to see to marking goods, and the invoice is given to a salesman who is supposed to know at what figure to mark the goods, but if he has a rule, as stated, he can make no mistake however little experience he has had. This plan of doing business leaves the more busy employees to attend to duties that need their especial knowledge. The same rule could be applied to stoves with only the slight variation of calling the retail price at the nearest quarter-dollar fraction. A stove costing $11, and sold on a 33⅓ per cent. profit, would be worth $14.66, but for convenience it could be marked under the rule $14.75. In stoves there would need to be one line of profit for certain goods as the leading lines, and another for cheap goods.

A feature of my plan is that it could so readily be made the basis for mutual agreement with dealers who are in the same locality as to have a uniform asking price for goods. I am not in favor of combinations in which all in a trade agree upon their "honor" to sell at a certain price and never vary from it. I am too old for that by a large majority, and if I wanted to set men who had been life-long friends at enmity I would recommend a combination on prices. It is business-like and helpful, however, for dealers to fix a profit percentage on the various lines of goods they sell and will go a long way toward uniformity and fair prices. It is, moreover, an easy thing to agree upon, as there is so little detail to it. Perhaps the most difficult line would be in stove repairs, but to-day there is more uniformity in both the wholesale and retail prices of castings, fire-brick, &c., than on any other goods sold. All that would be wanted would be a list drawing the line on heavy castings, like furnace fire-pots, for one line at a fixed percentage, and another for stove repairs, grates, cross-pieces, fire-brick, &c., all as simple as tin pans and shelf goods when understood. Now let us see the result and notice the advantage gained. A man wants a coal hod and is charged 71 cents for it. He first wonders why the 1 cent is put on and the next moment sees that it has been figured in a business way and that he is only charged the close price that the article could be afforded at. If the price given had been 70 cents, quite naturally he would want it for 65 cents and the seller is only required to say, in case a reduction is asked from the 71 cents, that it has been marked carefully at his lowest margin of profit, and the odd figures corroborate what he says. Then I would let the customer leave the article before I would take off the 1 cent!

The best proof I can offer that this plan is a good one is that I have tried it myself and obtained my theory from practice. The strongest hold that a merchant can secure on his customers is to show them that he runs his store himself, on his own money and in his own way, and that when he sells an article to a man who is not niggardly enough to "beat down" on it he pays no more than one who is a bore. The very highest position that can be obtained in mercantile life is to have a name that is a guarantee for the price put on the merchandise.

Excellent Work of a Spiegel Furnace.—Mr. G. C. Stone, of the New Jersey Zinc and Iron Company, Newark, N. J., gives us the following excellent record of one of the spiegel furnaces of that company: "We have now one furnace in blast, blown in May 15, and one out relining, to be blown in as soon as completed, probably about August 1. The furnace now out made the longest blast we have ever made here, and the longest run on spiegel that I know of, being in blast three years and two days. The product was:

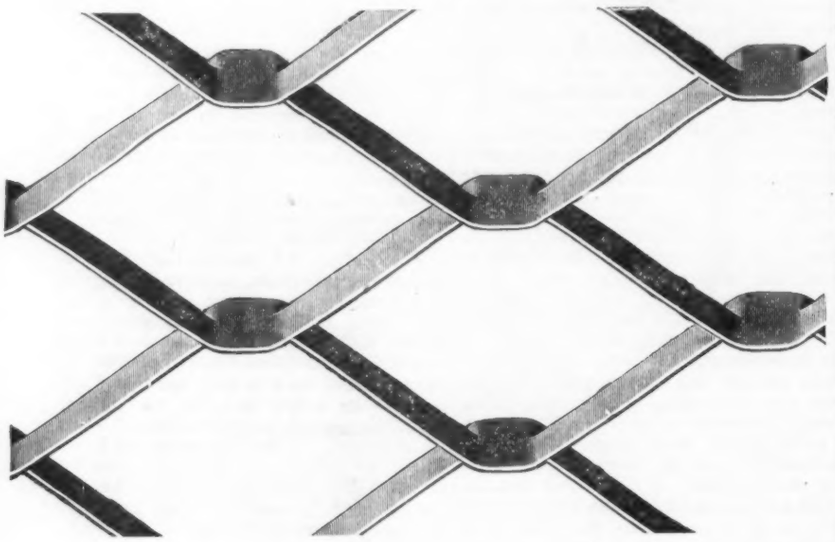
	Tons.	Cwt.	Pounds.
First year.....	3340	10	70
Second year.....	3443	13	57
Third year.....	3090	8	79
Total.....	9874	12	94

The average yield of ore was only 31.5 per cent. The spiegel averaged 19.55 per cent. manganese. It required 2 tons, 9 cwt., 22 pounds of coal to the ton of iron, and made about 6000 pounds slag to each ton of iron."

Relative Value of Silver and Gold.—In discussing the relative values of silver and gold, the London *Daily News* publishes figures to show that, notwithstanding the decline in the value of silver, its production has continued to increase at the same time that the annual supplies of gold have increased. Early in the present century the annual production of gold was about $10,000,000 on the average. After the great Californian discoveries the production rose for a time above $150,000,000, but for a series of years following the year 1859 the average was rather above than below $100,000,000. Of late the production of gold has been somewhat under $100,000,000 yearly. Of silver the supply varied between $40,000,000 and $52,500,000 for the 20 years ended with the year 1870; but no sooner did the value of silver begin to fall than the production steadily increased, until it is now nearly three times as great as it was a generation ago.

Expanded Metal.

The accompanying illustration represents a new metal product known as expanded metal. In form it resembles woven wire netting, and is intended to be used for the same purposes. It is made of sheet metal, cut in alternate slots by special machinery and expanded into open network, the sheets being increased in area from six to ten times, depending upon the size of the mesh. The cut gives a side view of the netting to show the shape of the metal, both in the strands and at the points of union.



Expanded Metal.

This article was invented in 1883 by J. F. Golding, of Chicago, and a patent covering the principle of its manufacture was obtained by him in 1884. Additional patents were subsequently secured on the different features of the machinery used to produce it. Oscar Bradford, president of the Curtiss & Co. Mfg. Company, and Henry S. Turner, of St. Louis, being convinced of the value of the invention, acquired an interest in it and contributed toward its successful development. In connection with Mr. Golding they have organizized the Expanded Metal Company, controlling every feature of expanded metal and the necessary machinery in the United States and several foreign countries.

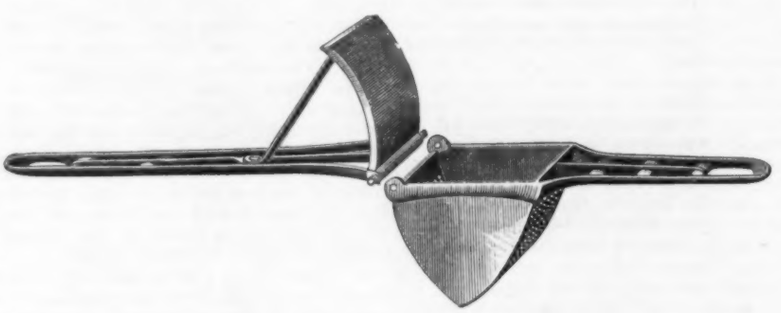
The usual difficulties were encountered in putting a new industry on a successful mechanical and commercial footing. Experiments in building machines were attempted at Chicago under the direction of the interested parties, but the only point accomplished was a demonstration of the practicability of the invention. Long & Allstatter, of Hamilton, Ohio, were then consulted, and they undertook to erect machines guaranteed to work, succeeding after a great deal of experimenting, which involved unavoidable delay. It is quite recently that all difficulties were surmounted, but three machines are now in full operation making expanded metal at the company's factory at Hermosa, six miles from Chicago, on the Chicago, Milwaukee and St. Paul Railroad. Facilities exist at these works for extensive operations when the growth of the business demands them. The Chicago office of the company is at 60 West Monroe street. Licenses to manufacture for exclusive territory have been issued to companies at St. Louis, San Francisco and Pittsburgh, in each of which places factories are or will shortly be in operation. Three other districts have been set off for exclusive control by separate licenses—namely, New England, the South Atlantic States and the Central South, and propositions are being received from several parties desiring to take hold. An English syndicate is being organized to conduct manufacturing operations in Great Britain.

The machines now in use for the manufacture of expanded metal are somewhat similar to a cornice brake, but fitted with a series of knives or cutters, one for each slot. These knives make but one-sized cut, different meshes, therefore, requiring different machines. The sheets of metal fed to the machine, of course, vary in size, according to the character of the product desired. A sheet 9 feet long and 7½ inches wide, for instance, is expanded to 3 feet in width but reduced to 8 feet in length. The sheet, after insertion in the machine, is fed automatically, cut and expanded at the same time, and is delivered without further attention. A 25 horse-power engine will furnish sufficient power to operate four machines. One machine will produce in ten hours, from No. 18 sheet, 10,000 square feet of expanded metal for use in window and skylight guards, around elevator shafts, in lawn fences, &c. The manufacturers claim for it great strength, as well as decided cheapness, in comparison with hand-woven wire. New uses are also expected for it, an inquiry coming from the engineers in charge of the Mississippi River improvements, who state that it is well adapted for the manufacture of mattresses used in revetting.

The company have issued an illustrated catalogue, which shows the great variety of purposes for which this netting can be used. At present nothing finer than 1-inch mesh is made, so that the expanded metal does not compete with wire cloth, such as is used for flour sieves, fly screens, &c. A very large field is found outside of these lines, however, as will be observed by reference to the catalogue. Lawn fencing, elevator guards, aviaries, summer doors for ventilation, arbors, vine and vegetable supports, farm and railroad fencing, farm gates, flower-bed inclosures, delivery-wagon screens, store partitions, poultry netting, skylight guards, tree boxes, desk railing, window guards, swinging signs and even door mats are among the uses enumerated, to which can be added a variety of special places in which wire netting is found desirable. The same principle is applied in the manufacture of steel fire-proof lathing. The manufacturers point out one essential difference between wire netting and expanded metal which is worth noting. Wire netting for the heavier uses must be made to order, while expanded metal can be carried in stock and is easily cut with shears or cold chisel to any shape required without leaving broken ends to be pulled or dropped out, as in the case of wire. The catalogue comprises 47 pages of very interesting matter, which will be sent to any address on application to the company at 60 West Monroe street, Chicago.

The Diehl Fruit Press and Vegetable Strainer.

This article, which is manufactured by Paine, Diehl & Co., Philadelphia, Pa., is shown in the illustration given herewith, which represents the two parts separated. It will be recognized as substantially the same as the P., D. & Co. press and strainer, with a modification by which the plunger can be conveniently and quickly removed so as to facilitate its use and the emptying or cleaning of the cup. The manufacturers call attention to the very considerable improvement which is thus made in the press, adapting it to other uses and making it more convenient for those to which it has heretofore been applied.



The Diehl Fruit Press and Strainer.

Official trials of a new form of log have recently been made on board some of the French torpedo boats. The log is made of bronze of cylindro-conical form, and weighs about 5.5 pounds. It is provided with a hollow tube running down its center, which is connected by a canvas-covered india-rubber tube to a pressure gauge on board. When the ship is under way the flow of the water past the log establishes a partial vacuum in the tube, and causes the pointer of the pressure gauge to move over its dial, which is graduated to give the speed of the vessel from 4 up to 25 knots.

Four artesian wells in Galveston are yielding copious supplies of water. The first one put down is expected to furnish, when completed, 1,000,000 gallons per day. It is not yet down 500 feet.

Some New Forms of Oil Cans.

We have referred in the past to the oil cans manufactured by W. J. Clark & Co., Salem, Ohio. In addition to the well-known lines that this firm have been supplying in the past, novelties are being continually brought out, and two of the most recent are shown in the accompanying engravings. The first represents a cheap form of can, similar in all respects to the C-jacketed can illustrated in these columns

Fig. 1.—Clark's C-Can without Jacket.

some time since, save only that the slatted jacket is omitted. The pump turns in its position, so as to make it convenient to fill a lamp at the side as shown. The pump is connected with the can by screws and a screw is also used at the top. The can is conveniently carried by a bail, and in all respects is portable, combining high utility with great convenience.

Figs. 2 and 3 represent what the firm describe as their rotating can. The can

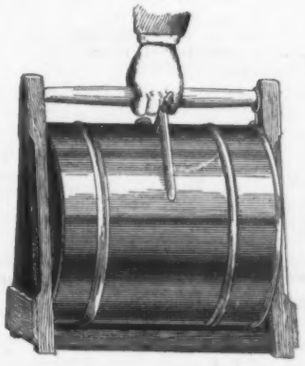


Fig. 2.—Clark's Rotating Can as it Goes to be Filled.

is swung in a frame which serves as a handle to carry the can when it goes to be filled. The two engravings illustrate the use of the can so clearly that it will be understood without explanation. When the can is being used for filling a lamp it is set upon the edge of a table or bench as shown in the third engraving. Both hands may be used in handling the lamp, simply a finger being engaged with the spout to pull the can forward, as clearly shown in the cut. After the lamp is filled, by simply raising the lamp and thereby imparting the opposite motion to the can or releasing the pressure, the flow of the fluid is stopped. Referring to the spout upon this can, it may be remarked that the passage of the oil is not through what would be regarded as the spout, but, instead, is through the brace or support under the spout. By this construction the can can be drained to the

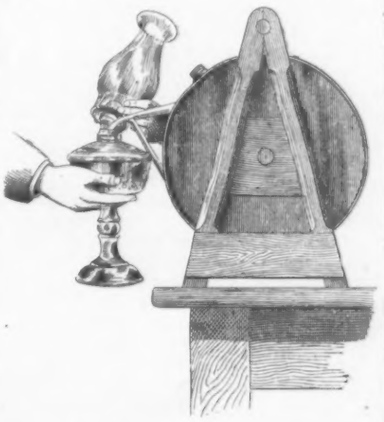
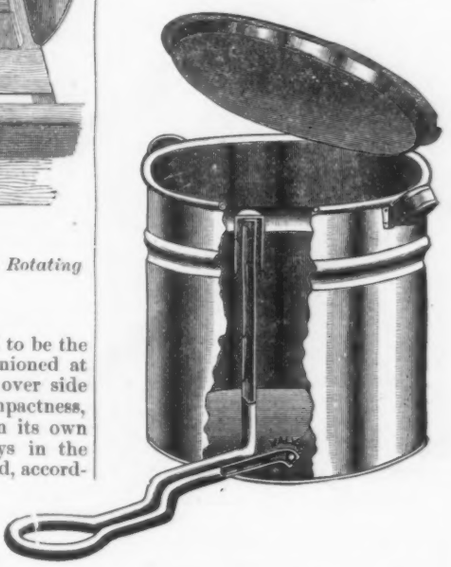


Fig. 3.—Method of Using Clark's Rotating Can.

last degree. This can is claimed to be the only one of its kind that is trunnioned at the ends. It has advantages over side trunnioned cans in point of compactness, and the fact that it rotates within its own space. The contents are always in the same relation to the trunnions, and, accordingly, it is as easy to rotate the can when full as when it is empty, a fact that will be appreciated by all who have occasion to use such a device. There is never any surging of the contents to cause unsteadiness or spilling. The can is provided with an automatic spring locking device which holds it in an upright position whenever at rest, and prevents rotating accidentally in a way to spill the contents. The can is supplied with a large screw-cap filling hole, and as the spout is also supplied with a cap, the device is claimed to be absolutely air-tight, and therefore specially adapted for holding gasoline and other similarly volatile fluids. In a letter recently received from this firm, they remark that they have been in this line of business since 1875, and have in that time produced an assortment of oil cans for family use which are very popular with the trade. They think, however, that in this new can they overcome certain objections which have heretofore prevailed against swinging cans, and in support of this proposition mention that it has come into instant favor wherever introduced. The can does away with the labor of pumping, and the bother to which pumps out of order subject their users.

Water Boiler for Vapor Stoves.

J. W. Stoffel, of Mascontah, Ill., is introducing to the trade a patent water heater for use in connection with gasoline



Water Boiler for Vapor Stoves.—Fig. 1.—Perspective View with Side Partially Broken Away, Showing Internal Arrangement.

stoves, two views of which are shown in the accompanying illustrations. Fig. 1 presents the device detached from the stove, and with the side partially broken away showing the internal construction. Fig 2 of the engravings shows the boiler as it appears when in use. It is constructed of sheet metal and provided with a cover which fits tightly. The principle upon which it works is that of the ordinary water-back, the supply entering the pipe at the base of the vessel, passing through the loop which encircles the central portion of the burner, becoming highly heated thereby and escapes to the boiler by means of the return pipe as shown in Fig. 1. This pipe projects upward to a point near the top of the boiler, and is furnished with a cap which causes any steam generated to be thrown downward, tending to keep the water hot, while also avoiding noise. The device is simple of construction and adapted for use on vapor stoves of various descriptions.

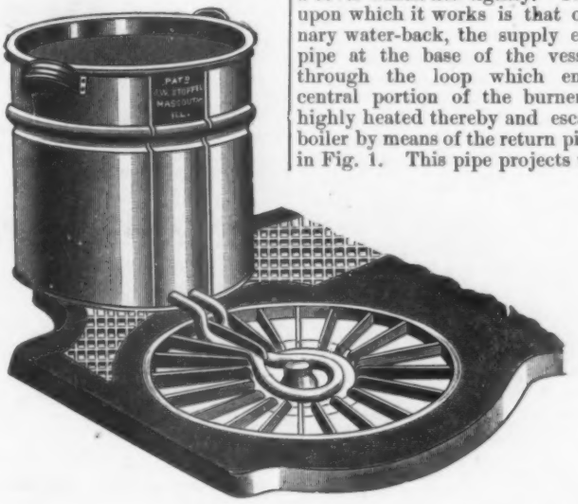
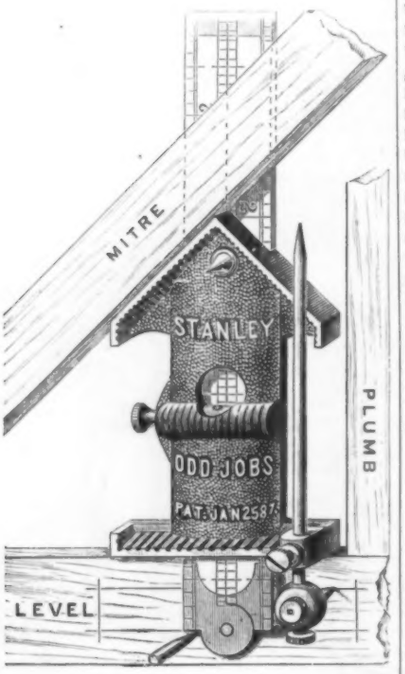


Fig. 2.—The Boiler in Use.

Odd Jobs.

A new tool has been brought out by the Stanley Rule and Level Company, New Britain, Conn., and 29 Chambers street, New York. It is illustrated in Fig. 6 and is called Odd Jobs, in view of what it will do. It consists of a casting some-



Odd Jobs.—A New Tool Brought Out by the Stanley Rule and Level Company, New York.

what resembling a miniature house gable, with one round window in the end. The gable part, as we have familiarly described it, is a right angle, thus making the tool available for miter purposes and as a tri-square. The base is at right angles to the center line of the casting, thus adapting it for a level. The mercury-tube will be noticed in the cut. The tool is to be used for various purposes in combination with a rule, and, for that reason, the back of the casting is channeled out just the right width to receive an ordinary 2-foot rule when closed. The little set-screw shown at the left in the cut engages with the edge of the rule and holds it in place. With the rule inserted the range of work that may be accomplished will be readily perceived. No less than ten special uses are enumerated in the circular put forth by the company. These are as follows: A (1) tri-square, which is so evident that it does not need any explanation. The same remark also applies to (2) miter square. By combining with the rule and extending one end of the rule below the square head or base already referred to, a (3) T-square is secured. By keeping the rule in the same position and using a pencil or scratch awl in the angle of the rule as shown in the cut (4) a marking gauge is obtained. In the same manner a (5) mortise gauge is secured. By reversing the rule and allowing the opposite end to project beyond the base, a (6) depth gauge is formed. A (7) miter level and also a (8) spirit level are secured in a way already described. A plumb is derived by a line brought against the top and bottom projections as indicated at the right of the engraving. Referring to the cut, near what we have called the gable of the casting, will be noticed a sharp point. This is in line with the end of the groove or channel for the rule on the back. With the rule in the position already indicated, and using the point referred to as a center, a (9) compass or device for striking circles is obtained and that, too, with the means at hand for adjusting the radius to suit circumstances. Instead of using the rule as above described, the long scribe or point, shown at the right, may be employed, as shown in the cut. The end of the rod opposite the point is adapted to receive and hold a pencil, thus still further increasing the utility of the article in this regard. By using the right-angled edges at the top, which we have familiarly described as the gable of the casting, an (10) inside square for boxes and frames is obtained. We are not altogether certain that the above enumeration covers all the uses to which this tool can be put, but we give them as the enumeration which the company have made and leave our ingenious readers to discover still others. Using the tool as a beam compass, it has a capacity of from 1½ to 13 inches diameter. Smaller circles can be made by reversing the steel rod so as to bring the pencil near the center point. A circle of 25 inches diameter can be swung if the rule alone is used with a pencil in the angle at its head. This little article is being supplied nickel-plated, put up in neat boxes and is a most desirable addition to any carpenter's kit.

Improved Bench Drill.

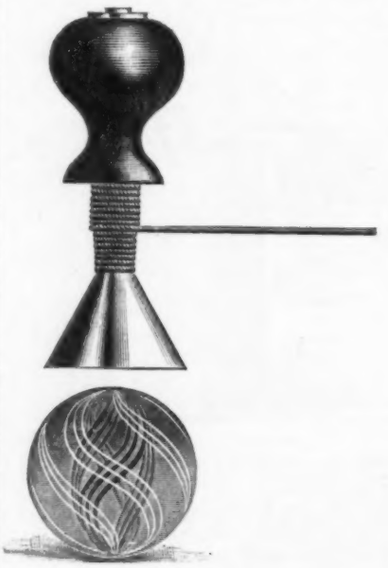
A few months since we presented in these columns a form of bench drill manufactured by Messrs. E. C. Stearns & Co., of Syracuse, N. Y. In the engraving annexed we show an improved form of the same drill, the special feature being the adjustable bed-plate, which may be raised or lowered to accommodate various styles and sizes of work. It is so constructed, it is stated, that by simply turning a crank the spindle is rapidly fed down to the work and as quickly withdrawn. The drill is 26½ inches, measured

Stearns' Improved Bench Drill.

from the base of standard to top of balance-wheel, and weighs 29 pounds. It is claimed to have a capacity for drilling any size of hole at a right angle with the bed-plate, from ¼ inch down to the smallest required. The drill-stock is 1⅛ inch in diameter, the run of the screw 3½ inches and the weight of the balance-wheel 6 pounds. With each drill is furnished a chuck, which attaches to the spindle and holds a ⅜-inch round drill or an ordinary square-tapered shank or brace drill. The drill is made of the best material, the main standard is neatly japanned, the hand wheel nickel-plated, the balance-wheel painted vermilion, while the bearings are finished with standard size reamers, with all parts interchangeable. The crank, as will be noticed by referring to the engraving, has an extension for large drilling, and the manufacturers state there are proper allowances for strength and durability.

Agate Spinner.

This toy is manufactured by the Wire Goods Company, Worcester, Mass., and is represented full size in the accompanying



Agate Spinner.

cut. Its use is sufficiently indicated in its name and in the illustration. It is stated that by means of it an agate may be made to spin on a dinner plate or other smooth surface from five to eight minutes. These articles are packed in neat boxes, containing each one spinner with agate, ready for retailing, having on the outside full directions in regard to the manner of use.

Continuous Steam Heating for Cars.—In summing up what was said of continuous steam heating for cars at the recent Master Car Builders' convention the *Railroad Gazette* remarks: "It seemed to be generally acknowledged that the results given by the various systems used were fairly satisfactory. It was also noticeable that while no reference was made to the difficulty of heating cars should the engine be stalled or break down on the road, numerous speakers stated that they had made arrangements for keeping the cars heated while they were standing at stations, junctions and terminal points. It seems to be a very general practice to keep the cars warm throughout the whole winter and to couple them up to a stationary boiler when the cars are standing and the locomotive is not available. None of the speakers appeared to have found any difficulty in carrying this into effect, while no complaint was made that the quantity of steam used in heating formed an appreciable tax on the steaming power of the locomotive."

The limited partnership of William D. Marvel & Co., Nos. 68 and 70 William street, has been dissolved by mutual consent. The Marvel Iron Company, Limited, and William D. Marvel will continue business at the same address.

CURRENT HARDWARE PRICES.

JULY 3, 1888.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

Ammunition.

Caps, Percussion, ₩ 1000—

Hicks & Goldmark's
F. L. Waterproof, 1-10's ..... 50¢ } dis 2*@
E. B. Trimmed Edge, 1-10's ..... 65¢ } 25&
E. B. Ground Edge, Central Fire, 1-10's, 70¢ } 7½ %
Double Waterproof, 1-10's ..... $1.40 }
Musket Waterproof, 1-10's ..... 52¢ @ 53¢
G. D. ..... 28¢
G. B. ..... 30¢
Union Metallic Cartridge Co.
F. C. Trimmed ..... 50¢ } dis 25@
F. L. Ground ..... 65¢ } 25&
Cen. Fire Ground ..... 70¢ } 7½ %
Double Waterproof ..... $1.40 }
Double Waterproof, in 1-10's ..... $1.40 }
G. B. Genuine Imported ..... 45¢
Eley's E. B. ..... 54¢ @ 56¢
Eley's D Waterproof, Central Fire $1.60

Cartridges—

Rim Fire Cartridges ..... dis 50&5&2 %
Rim Fire Military Cartridges ..... dis 15&2 %
Cen. Fire Cartridges, Pistol and Rifle ... dis 25&5&2 %
Cen. Fire Cartr., Military & Sporting ... dis 15&5&2 %
Blank Cartridges, except 22 and 32 cal., an additional 10 % over above discounts.
Blank Cartridges .22 cal. ..... $1.75, dis 2 %
Blank Cartridges, 32 cal. ..... $3.50, dis 2 %
Primed Shells and Bullets ..... dis 15&5&2 %
B. B. Caps, Round Ball ..... $1.75, dis 2 %
B. B. Caps, Conical Ball, Swaged ..... $2.00, dis 2 %

Primers—

Berdan Primers all sizes, and B. L. Caps (for Sturtevant Shells) ..... $1.00, dis 2 %
All other Primers, all sizes ..... $1.20 dis 2 %

Shells—

First quality, 4, 8, 10 and 12 gauge ... dis 25&10&2 %
First quality, 14, 16 and 20 gauge ($10 list) ..... dis 30&10&2 %
Star, Club, Rival and Climax Brands, 10-gauge, $9 list } dis 33⅓&10
12 gauge, $8 list } 2 %
Club, Rival and Climax Brands, 14, 16 and 20 gauge ..... dis 30&10&2 %
Selbold's Combination Shot Shells ..... dis 15&2 %
Brass Shot Shells, 1st quality ..... dis 60&2 %
Brass Shot Shells, Club, Rival & Climax ... dis 65&2 %

Shells Loaded—

List No. 19, 1887 ..... dis 20 & 10 %

Wads—

U. M. C. & W. R. A.—B. E., 11 up ... $2.00 }
U. M. C. & W. R. A.—B. E., 9&10 ... 2.30 }
U. M. C. & W. R. A.—B. E., 7&8 ... 2.60 } dis 20&2 %
U. M. C. & W. R. A.—P. E., 11 up ... 3.10 }
U. M. C. & W. R. A.—P. E., 9&10 ... 4.00 }
U. M. C. & W. R. A.—P. E., 7&8 ... 4.90 }
Eley's B. E., 11 up $1.75
Eley's P. E. 11 @ 20 ..... $2.80

Anvils.—Eagle Anvils ... ₩ ℔ 10¢, dis 20 @ 20&5 %
Wright's ..... 9½¢
Armitage's Mouse Hole ..... 8¾¢
Armitage Mouse Hole, Extra ..... 11¼ @ 11¾¢
Trenton ..... 9¼¢@9½¢
Wilkinson's ..... 9¾¢@10¢
J. & Riley Carr, Patent Solid ..... 11@11¾¢

Anvil Vise and Drill—

Millers Falls Co. ..... $18.00, dis 20 %
Chenev Anvil and Vise ..... dis 25 %
Allen Combined Anvil and Vise ..... $3, dis 40&10 %
Moore & Barnes Mfg. Co. ..... dis 33⅓ %

Augers and Bits.

Douglass Mfg. Co. }
New Haven Copper Co. }
Wm. A. Ives & Co. } ..... dis 70 %
Humphreysville Mfg. Co. }
French, Swift & Co. (F. H. Beecher) }
Cook's, Douglass Mfg. Co. ..... dis 55 %
Cook's, New Haven Copper Co. ... dis 50&10&50&10&5 %
Ives' Circular Lip ..... dis 60 %
Patent Solid Head ..... dis 30 %
C. E. Jennings & Co., No. 10, extension lip ..... dis 40 %
C. E. Jennings & Co., No. 30 ..... dis 60 %
C. E. Jennings & Co., Auger Bits, in fancy boxes, ₩ set, 32¼ quarters, No 5, $5; No. 3, $2 ..... dis 20 %
Lowis' Patent Single Twist ..... dis 45 %
Russell Jennings' Augers and Bits ..... dis 25 %
Imitation Jennings' Bits (new list) ..... dis 60@60&5 %
Pugh's Black ..... dis 20 %
Car Bits ..... dis 50&10@60 %
L'Hommedieu Car Bits ..... dis 15&10 %
Forstner Pat. Auger Bits ..... dis 10 %

Hollow Augers—

Ives' } ..... dis 25&10 @
French, Swift & Co. } 25&10&5 %
Douglass' }
Bonney's Adjustable ₩ doz. $15 ..... dis 40&10 %
Stearns' ..... dis 20&10 %
Ives' Expansive, each $4.50 ..... dis 50&10 %
Universal Expansive, each $4.50 ..... dis 20 %
Wood's ..... dis 25 @ 25&10 %

Expansive Bits—

Clark's small, $18; large, $30 ..... dis 35 @ 35&5 %
Ives' No. 4, per doz., $90 ..... dis 35 @ 40 %
Swan's ..... dis 40 %
Steer's, No. 1, $20; No. 2, $22 ..... dis 35 %
Stearns' No. 2, $48 ..... dis 20 %

Gimlet Bits—

Common ..... ₩ gross $2.75 @ $3.25
Diamond ..... ₩ doz. $1.10, dis 25&10 %
"Bee" ..... dis 25 @ 25&5 %
Double Cut, Shepardson's ..... dis 45 @ 45&5 %
Double Cut, Ct. Valley Mfg. Co. ..... dis 30&10 %
Double Cut, Hartwell's, ₩ gro. $5.25
Double Cut, Douglass' ..... dis 40&10 %
Double Cut, Ives' ..... dis 60 @ 60&5 %

Bit Stock Drills—

Morse Twist Drills ..... dis 50&10&5 %
Standard ..... dis 50&10&5 %
Cleveland ..... dis 50&10&5 %
Syracuse, for metal ..... dis 50&10&5 %
Syracuse, for wood (wood list) ..... dis 30 @ 30&5 %
Williams' or Holt's, for metal ..... dis 50&10&10 %
Williams' or Holt's, for wood ..... dis 40&10 %

Ship Augers and Bits—

L'Hommedieu's ..... dis 15&10 %
Watrous's ..... dis 15&10 %
Snell's ..... dis 15&10 %
Snell's Ship Auger Pattern Car Bits ..... dis 15&10 %

Awl Hafts.

Sewing, Brass Ferrule ..... $3.50 ₩ gross—dis 45&10 %
Patent Sewing, Short ..... $1.00 ₩ doz—dis 40&10 %
Patent Sewing, Long ..... $1.20 ₩ doz.—net
Patent Peg, Plain Top ..... $10.00 ₩ gross—dis 45&10 %
Patent Peg, Leather Top ..... $12.00 ₩ gross—dis 45&10 %

Awls, Brad Sets, &c.

Awls, Sewing, Common ..... ₩ gross $1.70—dis 35 %
Awls, Shouldered Peg ..... ₩ gross $2.45—dis 40@40&10 %
Awls, Patent Peg ..... ₩ gross 65¢—dis 40@40&10 %
Awls, Shouldered Brad ..... $2.70 ₩ gross—dis 35 %
Awls, Handled Brad ..... $7.50 ₩ gross—dis 45 %
Awls, Handled Scratch ..... $7.50 ₩ gross—dis 35&10 %
Awls, Socket Scratch ..... $1.50 ₩ doz—dis 25 @ 30 %

Awl and Tool Sets.

Aiken's Sets, Awls & Tools, No. 20, ₩ doz. $10—dis 50&10 %
Gray's Ad Tool Hdls., Nos. 1, $12; 2, $18.; 3, $12; 4, $9. dis 25@25&10 %
Miller's Falls Adj. Tool Hdls., Nos. 1, $12; 2, $18, dis 25 %
Henry's Combination Haft ..... ₩ doz. $6
Brad Sets, No. 42, $10.50, No. 43, $12.50 ... dis 70&10&5 %
Brad Sets, Stanley's Excelsior, No. 1, $7.50. }
Brad Sets, Stanley's Excelsior, No. 2, $4.00. } dis 30&10 %
Brad Sets, Stanley's Excelsior, No. 3, $5.50. }

Axes.

Makers' and Special Brands—

First quality ..... ₩ doz, $6.00 @ $6.50
Others ..... ₩ doz, $5.50 @ $5.75

Axle Grease.

Fraser's, in bulk ..... Keg ₩ ℔, 4¢; Pail, ₩ ℔, 5¢ net
Frasers, in boxes ..... ₩ gross $9.50
Dixon's Everlasting, in bxs., ₩ doz., 1 ℔: $1.20; 2 ℔, $2
Dixon's Everlasting ..... 10-℔ pails, each, 85¢
Lower grades, special brands ..... ₩ gro $5.50 @ $7

Axles.—No. 1, 4¢ @ 4¼¢ No. 2, 5¼ @ 5½¢.

Nos. 7 to 18 ..... dis 50@55 %
Nos. 19 to 22 ..... dis 60&10&10@70 %
National Wrought Steel Tubular Self-Oiling:
Standard Farm (1 to 5) and Special Farm (A1 to A5)
Less than 10 sets ..... dis 33⅓ %
Over 10 sets ..... dis 33⅓&5 %
X Strong Exp. (6 to 9), & XX Strong Truck (10 to 16):
Less than 10 sets ..... dis 10 %
Over 10 sets ..... dis 10&5 %

Bag Holders.

Sprengle's Pat., ₩ doz $18. ..... dis 60 %

Balances.—Spring Balances.

Common 24 ℔ ..... ₩ doz., $1.50—dis 50 %
Chatillon's Spring Balances ..... dis 50 %
Chatillon's Circular Spring Balances ..... dis 60 %

Bells.

Hand—

Light Brass ..... dis 70&10 %
Extra Heavy ..... dis 60&10 %
White Metal ..... dis 60&10&10 %
Silver Chime ..... dis 25&10&5 %
Globe (Cone's Patent) ..... dis 25&10 @ 35 %

Door—

Gong, Abbe's ..... dis 25&10 @ 35 %
Gong, Yankee ..... dis 40&10 %
Gong, Barton's ..... dis 40&10 @ 50 %
Crank, Taylor's ..... dis 25&10 %
Crank, Brooks' ..... dis 50&10&2 %
Crank, Cone's ..... dis 10 %
Crank, Connell's ..... dis 20&10 %
Lever, Sargent's ..... dis 60&10 %
Lever, Taylor's Bronzed or Plated ..... net
Lever, Taylor's Japanned ..... dis 25&10 %
Lever, R. E. ₩ Co.'s ..... dis 50&10&2 %
Pull, Brook's ..... dis 50&10&2 %
Pull Western ..... dis 25&10 %

Cow—

Common Wrought ..... dis 60&10 %
Western ..... dis 20&10 %
Western, Sargent's list ..... dis 70&10 %
Kentucky "Star" ..... dis 20&10 %
Kentucky, Sargent's list ..... dis 70&10 %
Dodge, Genuine Kentucky, new list ... dis 70@70&10 %
Texas Star ..... dis 50&10 @ 50&10&5 %
Call ..... dis 40@40&5 %
Farm Bells ..... ₩ ℔, 3¢ @ 3½¢
Steel Alloy Church and School Bells ..... dis 40 %

Bellows.—Blacksmiths'.

Molders' ..... dis 40 @ 40&10 %
Hand Bellows ..... dis 40&10 @ 50 %

Belting, Rubber.

Common Standard ..... dis 70&10 %
Standard ..... dis 70 %
Extra ..... dis 60&10 %
N. Y. S. & P. Co., Standard ..... dis 60&5 %
N. Y. S. & P. Co., Extra Standard ..... dis 50&10 %

Bench Stops.

Morrill's ..... ₩ doz $9—dis 50 %
Hotchkiss's ..... ₩ doz $5.00—dis 10 @ 10&10 %
Weston's, per doz No. 1, $10; No. 2, $9 ... dis 25&10&5 %
McGill's ..... ₩ doz $3—dis 10 %

Bits.—Auger, Gimlet Bit Stock, Drills, &c., see Augers and Bits.

Bit Holders.

Extension, Barber's ..... ₩ doz $15.00—dis 40 @ 40&10 %
Extension, Ives' ..... ₩ doz $20.00—dis 60&5 @ 60&10 %
Diagonal ..... ₩ doz $24.00—dis 40 %
Angular ..... ₩ doz $24.00—dis 40&5 %

Blind Adjusters.

Domestic ..... ₩ per doz $3.00—dis 33⅓ %
Excelsior ..... ₩ doz $10.00—dis 50&10&2 %
Washburn's Self-Locking ..... dis 20 @ 20&10 %

Blind Fasteners.

Mackrell's ..... ₩ doz pairs, $1.00—dis 20@20&10 %
Van Sand's Screw Pattern ..... $15 ₩ gro.—dis 60&10 %
Van Sand's Old Pattern ..... $15 ₩ gro.—dis 55&10 %
Washburn's Old Pattern ..... $9 ₩ gro. net
Merriman's ..... new list, net
Austin & Eddy No. 2008 ..... $9 ₩ gro. net
Security Gravity ..... $9 ₩ gro. net

Blind Staples.

Barbed, ½ in. and larger ..... ₩ ℔ 8 @ 8½¢ net
Barbed, ⅝ in ..... ₩ ℔ 9 @ 9½¢ net

Blocks.

Ordinary Tackle, list April 17, '85 ..... dis 40 %
Cleveland Block Co., Mal. Iron ..... dis 50 %
Novelty Tackle Blocks, Mal. Iron ..... dis 50 %

Bolts.

Door and Shutter—

Cast Iron Barrel, Square, &c. ..... dis 70 @ 70&10 %
Cast Iron Shutter Bolts ..... dis 70 @ 70&10 %
Cast Iron Chain (Sargent's list) ..... dis 65&10 %
Ives' Patent Door Bolts ..... dis 55 %
Wrought Barrel ..... dis 70 @ 70&10 %
Wrought Square ..... dis 70 @ 70&10 %
Wr't Shutter, all Iron, Stanley's list ..... dis 60&10 %
Wr't Shutter, Brass Knob, Stanley's ..... dis 40&10 %
Wrought Shutter, Sargent's list ..... dis 60&10 %
Wrought Sunk Flush, Sargent's list ..... dis 55&10 %
Wrought Sunk Flush, Stanley's list ..... dis 50&10 %
Wrought B. K. Flush, Com'n Stanley's list, dis 65&10 %

Carriage—

Com. list June 10, '84 ..... dis 70&10&5 %
Genuine Eagle, list Oct., '84 ..... dis 75 @ 75&5 %
Phila. pattern, list Oct. 7, 84 ... dis 75&10@75&10&5 %
R. B. & W., old list ..... dis 70 %

Tire—

Common, list Feb. 28, 1883 ..... dis 70 %
P. C. B. & N. Co., Empire, list Feb. 28, 1883 ... dis 70 %
P. C. B. & N. Co., Philadel., list Oct. 84. ... dis 82½ %
P.C.B.&N.Co., Keystone, Phil. list, Oct. '84 ... dis 80 %
P.C.B.&N.Co., Norway, Phil. list, Oct. '84 ... dis 75&10 %
Am. S. Co., Norway, Phil., list Oct. 16, '84 ... dis 75&10 %
Am. S. Co., Eagle, Phil., list Oct. 16, '84 ... dis 80 %
Am. S. Co., Philadel. list, Oct. 16, 84 ... dis 82½ %
Am. S. Co., Bay State, list Feb. 28, '83 ... dis 70 %
R. B. & W., Philadel. list Oct. 16, 1884 ... dis 82 %
R. & E. Mfg. Co. ..... dis 70 %

Stove and Plow—

Stove ..... dis 62½ %
Plow ..... dis 60&5 %
Am. S. Co. Stove, Annealed ..... dis 62½ %
R. B. & W., Plow ..... dis 55 %
R. B. & W., Stove ..... dis 62½ %
R. & E. Mfg. Co., Stove ..... dis 62½ %
Machine ..... dis 75 @ 75&10 %
Bolt Ends ..... dis 75 @ 75&10 %

Borax ..... ₩ ℔ 9½@10¼¢

Boring Machines.

Without Augers.	Upright.	Angular.
Douglass	$5.50	$6.75 ... dis 50 %
Snell's, Rice's Patent	5.50	6.75 dis 40&10&10 %
Jennings	5.50	6.75 dis 45@45&10%
Other Machines	2.35	2.75 ... net
Phillips' Pat., with Augers	7.00	7.50 ... net

Bow Pins

Humason, Beckley & Co.'s ..... dis 60&10 %
Sargent & Co.'s ..... $17 and $18, dis 60&10 %
Peck, Stow & W. Co. ..... dis 50&10 @ 50&10&5 %

Braces.

Backus, Nos. 110 to 114 and 31 to 33 .. dis 60&5@60&10%
Backus, Nos. 6, 8, 12, 14 ..... dis 60&10&5 %
Backus, Nos. 16, 18, 20, 29, 7 .9, 11 ... dis 70&10&5 %
Barber's, Nos. 10 to 16 ..... dis 50 %
Barber's, Nos. 30 to 33 ..... dis 50¢
Barber's, Nos. 40 to 63 ..... dis 50&10¢
Barker's, Nos. 8, 10 and 12 ..... dis 75&10@80 %
Barker's, Plated, Nos. 8, 10 and 12 ..... dis 65&10@70 %
Osgood's Ratchet ..... dis 40&10&50 %
Spofford's ..... dis 50&10 %
Ives' New Haven Novelty ..... dis 70 @ 70&5 %
Ives' New Haven Ratchet ..... dis 6..&5 @ 60&10 %
Ives' Barber Ratchet ..... dis 60&5 @ 60&10 %
Ives' Barbers ..... dis 60&5 @ 60&10 %
Ives' Spofford ..... dis 60&5 @ 60&10 %
Common Ball, American ..... $1.10 @ $1.15
Bartholomew's, Nos. 25, 27, 30 ... dis 50&10&60&5 %
Bartholomew's, Nos. 117 118 .119 ... dis 70 @ 70&5 %
Amidon's Barker's Imp'd Plain ... dis 75&10 @ 80 %
Amidon's Barker's Imp. Nickeled ... dis 65&10 @ 70 %
Amidon's Ratchet ..... dis 75&10 @ 80 %
Amidon's Eclipse Ratchet ..... dis 60 %
Amidon's Globe Jawed ..... dis 40&10&10 %
Amidon's Corner Brace ..... dis 40 @ 40&10 %
Amidon's Universal ..... 8 in., $2.10; 10 in., $2.25
Amidon's Buffalo Ball ..... $1.10 @ $1.15
P. S. & W ..... dis 50&10 %

Brackets.

Shelf, plain, Sargent's list ... dis 55&10 @ 55&10&10 %
Shelf, fancy, Sargent's list ... dis 60&10 @ 60&10&10 %
Reading, plain ..... dis 60&10 @ 60&10&5 %
Reading, Rosette ..... dis 60&10 @ 60&10&10 %

Bright Wire Goods.—..... dis 75&10&10@—%

Broilers.	Inch.	9	10	9 x 12
Henis' Self-Basting	Per doz.	$4.50	5.50	6.50

Buckets.—See Well Buckets and Pails.

Bull Rings.—Union Co. Nut ..... dis 55 %
Sargent's ..... dis 60&10 @ 70&5 %
Hotchkiss' low list ..... dis 30 %
Humason, Beckley & Co.'s ..... dis 70 %
Peck, Stow & W. Co.'s ..... dis 50&10 @ 50&10&10 %
Elfrich Hdw. Co., White Metal, low list ... dis 50@50&10 %

Butcher's Cleavers.

Bradley's ..... dis 25 @ 30
L. & I. J. White ..... dis 20&5¢
Beatty's ..... dis 40 @ 40&5%

	2	3	4	5	6	7	8
	$16.50	19.00	21.50	24.00	27.00	30.00	33.50	36.50

New Haven Edge Tool Co.'s ..... dis 40
P. S. & W ..... dis 33⅓&5@33⅓&10

Butts.

Brass—

Wrought Brass ..... dis 70@70&10 %
Cast Brass, Tiebout's ..... dis 33⅓&10 %
Cast Brass, Corbin's Fast ..... dis 33⅓&10 %
Cast Brass, Loose Joint ..... dis 33⅓&10 %

Cast Iron—

Fast Joint, Narrow ..... dis 50&10
Fast Joint, Broad ..... dis 55&10
Loose Joint ..... dis 60¼&10
Loose Joint, Japanned ..... dis 60¼&10
Loose Joint, Jap. with Acorns ..... dis 60¼&10
Parliament Butts ..... dis 60¼&10
Mayer's Hinges ..... dis 60¼&10
Loose Pin, Acorns ..... dis 60¼&10
Loose Pin, Acorns, Japanned ..... dis 60¼&10
Loose Pin, Acorns, Jap, Pltd. Tips ..... dis 60¼&10

Wrought (Steel—

Fast Joint Narrow ..... dis 70&10 %
Fast Joint, Lt. Narrow ..... dis 70&10 %
Fast Joint, Broad ..... dis 70&10 %
Loose Joint, Broad ..... dis 70&10 %
Table Butts, Back Flaps, &c ..... dis 70&10 %
Inside Blind, Regular ..... dis 70&10 %
Inside Blind, Light ..... dis 70&10 %
Loose Pin ..... dis 70&10 %
Bronzed Wrought Butts ..... dis 40&10&40&10&5 %

Calipers.—See Compasses.

Calks, Toe.

Gautier ..... ₩ ℔ 5¼@6¢
Dewicks ..... ₩ ℔ 5¼@6¢

Can Openers.

Messenger's Comet ..... ₩ doz $3.00, dis 25 %
American ..... ₩ gross $3.00
Duplex ..... dos 25¢, dis 15 @ 20 %
Lyman's ..... ₩ doz $3.75, dis 20 %
No. 4, French ..... ₩ doz $2.25, dis 55 @ 60 %
No. 5, Iron handle ..... ₩ gross $6.90, dis 45 @ 50 %
Eureka ..... ₩ doz $2.50, dis 10 %
Sardine Scissors ..... ₩ doz $2.75@$3.00 %
Star ..... ₩ doz $2.75 %
Sprague, No. 1, ₩ 2 ..... 3 $2.50 ..... dis 50@10&10 %

World's Best. ₱ gross, No. 1, $12.00; No. 2, $24.00, No. 3, $36.00.....dis 50&10 %
Universal.....₱ doz $3 00, dis 35&5 %
Domestic.....₱ doz $2.50, dis 45 %
Champion.....₱ doz $2.00, dis 50 %

Cards.
Horse and Curry.....dis 10 @ 10&10 %
Cotton.....New list, Aug., 1883, dis 10 %
Wool..... " " " dis 10 %

Carpet Stretchers.
Cast Steel, Polished.....₱ doz $2.25
Cast Iron, Steel Points.....₱ doz 80¢
Socket.....₱ doz $1.75
Bullard's.....dis 25 @ 25&10 %

Carpet Sweepers.
Bissell No. 5.....₱ doz $17.00
Bissell No. 7 New Drop Pan.....₱ doz $19.00
Bissell Grand.....₱ doz $36 00
Grand Rapids.....₱ doz $24.00
Crown Jewel.....No. 1, $18; No. 2, $19; No. 3, $20
Magic.....₱ doz $15.00
Jewel.....₱ doz $17.00
Mystic.....₱ doz $16.00
Cottage.....₱ doz $15.00
Garland.....₱ doz $18.00
Parlor Queen.....₱ doz $24.00
Housewife's Delight.....₱ doz $15:00
Queen.....₱ doz $16.00
Queen, with band.....₱ doz $18.00
King.....₱ doz $30.00
Weed Improved.....₱ doz $18.00
Hub.....₱ doz $16.00
Cog Wheel.....₱ doz $16.00

Cartridges.—See Ammunition.

Casters.
Bed, Plate, Shallow Socket.....} New list: Brass...dis 55 @ 55&5 %; Others..dis 60 @ 60&5 %
Deep Socket.....40&10 %
Yale Casters, list May, 1884.....dis 50&10&40 %
Yale, Gem.....dis 60&60&5 %
Martin's Patent (Phœnix).....dis 45&10 @ 50 %
Payson's Anti-friction.....dis 60 @ 60&10 %
"Giant" Truck Casters.....dis 10 @ 10&5 %
Stationary Truck Casters.....dis 45&10

Cattle Leaders.
Humason, Beckley & Co.'s.....dis 70 %
Sargent's.....dis 66⅔&10 %
Hotchkiss.....dis 30 %
Peck Stow & W. Co.....dis 50&10 %

Chain.
Trace, 6¼-10-3, exact sizes, ₱ pair, $1 03 } dis 50&10&5
Trace, 6¼-10-3, exact sizes, ₱ pair, .92 } @ 50&10&7½ %
Trace .7-10-2, exact sizes...₱ pair, 1.11 }
NOTE.—Traces, "Regular" sizes 3¢ net ₱ pair less than exact.
Log, Fifth, Stretcher, and other fancy Chains, list Nov. 1, 1884.....dis 50&10 @ 50&10&5 %
American Coil 3-16 ¼ 5-16 ⅜ 7-16 ½ ⅝ ¾
In cask lots. 8.75 6.00 5.00 4.50 4.40 4.00 3.75 3.50
Less than cask lots, add ¼¢@½¢ ₱ lb.
German Coil, list of June 20, 1887...dis 50&10&5@60 %
Ger. Halter Chain, list of June 20, 1887.....dis 50&10&5@60 %
Covert Halter, Hitching and Breast.....dis 50&2 %
Covert Traces.....dis 35@2 %
Oneida Halter Chain.....dis 60 @ 60&5 %
Galvanized Pump Chain.....₱ lb 6¢ @ 6¼
Jack Chain, Iron.....dis 70&10 @ 75 %
Jack Chain, Brass.....dis 65 @ 70 %

Chalk.
White.....₱ gro 50¢
Red.....₱ gro 70¢
Blue.....₱ gro 8 ¢
White Crayons.....₱ gro 12¢ @ 12¼ dis 10¢

Chalk Lines.—See Lines.

Chisels.
Socket Framing and Firmer—
P., S. & W., New Haven and Middlesex, Mix } dis 75&5 @ 75&10 %
In cask lots. 8.75 6.00 5.00 4.50 4.40 4.00 3.75 3.50
Less than cask lots, add ¼¢@½¢ ₱ lb.
Buck Bros.....dis 30 %
Merrill.....dis 60&10&60&10&5 %
L. & I. J. White.....dis 30 @ 30&5 %
Witherby and Douglass.....dis 75 @ 75&5 %
Tanged Firmers.....dis 40&10 %
Tanged Firmers, Butcher's.....$4.75 @ $5.00
Tanged Firmers, Spear & Jackson's.....$5.00 to $
Tanged Firmers, Buck Bros.....dis 30 %
Cold Chisels, ₱ lb.....16¢ @ 19¢

Chucks.
Beach Patent.....each, $8.00, dis 20 %
Morse's Adjustable.....each, $7.00, dis 20 @ 20&5 %
Danbury.....each, $6.00, dis 30 @ 30&5 %
Syracuse, Bals Pat.....dis 25 %

Clamps.
Providence Tool Co.'s Wrought Iron.....dis 25 %
Adjustable, Gray's.....dis 20 %
Adjustable, Lambert's.....dis 20 %
Adjustable, Snow's.....dis 40&5 %
Adjustable, Hammer's.....dis 15 %
Adjustable, Stearns'.....dis 20&10 %
Stearns' Adjustable Cabinet and Corner...dis 20&10 %
Cabinet, Sargent's.....dis 66⅔&10 %
Carriage Makers', Sargent's.....dis 66⅔&10 %
Ebernard Mfg. Co.....dis 40&5 @ 40&10 %
Warner's.....dis 40&10 @ 40&10&5 %
Saw Clamps.....See Vises

Clips.
Norway, Axle, ¼ & 5-16.....dis 5&5&5
Second grade Norway Axle, ¼ & 5-16.....dis 65&5
Superior Axle Clips.....dis 66⅔&5 @ 66⅔&5&5 %
Norway Spring Bar Clips, 5-16.....dis 60&5&5
Wrought-Iron Felloe Clips.....₱ lb 5½¢
Steel Felloe Clips.....₱ lb 5¢
Cockeyes.....dis 50 %

Cocks, Brass.
Hardware list.....dis 40&10&2 %

Coffee Mills.
Box and Side, List revised Jan. ", 1888.....dis 50&2 %
American, Enterprise Mfg Co.....dis 20&10&30 %
The "Swift," Lane Bros.....dis 20&10 %

Compasses, Dividers, &c.
Compasses, Calipers, Dividers.....dis 70@70&10 %
Bemis & Call Co.'s Dividers.....dis 60&5 %
Bemis & Call Co.'s Compasses & Calipers.....dis 50&5 %
Bemis & Call Co.'s Wing & Inside or Outside.dis 50&5 %
Bemis & Call Co.'s Double.....dis 60 %
Bemis & Call Co.'s (Call's Patent Inside).....dis 30 %
Excelsior.....dis 50 %
J. Stevens & Co.'s Calipers and Dividers.....dis 20&10 %

Coopers' Tools.
Bradley's.....dis 20 %
Barton's.....dis 20@20&5 %
L. & I. J. White.....dis 20&5 %
Albertson Mfg. Co.....dis 25 %
Beatty's.....dis 40 @ 40&5 %
Sandusky Tool Co.....dis 30 @ 30&5 %

Corkscrews.
Humason & Beckley Mfg. Co.....dis 40 @ 40&10 %
Clough's Patent.....dis 33⅓ @ 33⅓&5 %
Howe Bros. & Hulbert.....dis 35 %

Corn Knives and Cutters.
Bradley's.....dis 10 %
Wadsworth's.....dis 25 %

Cradles.—Grain.....dis 50&10 %

Crow Bars.
Cast Steel.....₱ lb 4¢
Iron, Steel Points.....₱ lb 3½¢

Curry Combs.
Fitch's.....dis 50&10 @ 50&10&10 %
Rubber.....₱ doz $10.00, dis 20 %
Perfect.....dis 50 %

Curtain Pins.
Silvered Glass.....net
White Enamel.....net

Cutlery.
Beaver Falls and Booth's.....dis 33⅓ %
Wostenholme.....$7.75 to $

Dampers, &c.
Dampers, Buffalo.....dis 50 %
Buffalo Damper Clips.....dis 40 %
Crown Damper.....dis 40 %
Excelsior.....dis 40&10 %

Dividers—See Compasses.

Dog Collars.
Embossed Gilt, Pope & Stevens' list.....dis 30&10 %
Leather, Pope & Stevens' list.....dis 40 %
Brass, Pope & Stevens' list.....dis 40 %

Door Springs.
Torrey's Rod, regular size.....₱ doz $1.30
Gray's.....₱ gro, $20.00, dis 20 %
Bee Rod.....₱ gro, $20.00, dis 20 %
Warner's No. 1, ₱ doz, $2.50; No. 2, $3.30. dis 40&10@50 %
Gem (Coil), list April 19, 1886.....dis 10 %
Star (Coil), list April 19, 1886.....dis 20 %
Victor (Coil).....dis 60 @ 60&10 %
Champion (Coil).....dis 60&10 @ 60&10&10 %
Philadelphia.....5 in., $5.00; 8 in., $7.75, dis 30 %
Cowell's.....No. 1, ₱ doz $18.00; No. 2, $15.00, dis 50 %
Rubber, complete.....₱ doz $4.50, dis 55&10 %
Hercules.....dis 50 %
Shaw Door Check and Spring.....dis 25 @ 30 @ 35 %
Elliott's Door Check and Spring.....dis 25 @ 25&5 %

Drawing Knives.
P. S. & W., Mix } dis 75&5 @ 75&10 %
New Haven and Middlesex.....
Merrill.....dis 60&10&10 %
Witherby and Douglass.....dis 75@75&5 %
Watrous.....dis 15&10 @ 25 %
L. & I. J. White.....dis 20&5 %
Bradley's.....dis 35 %
Adjustable Handle.....dis 20 @ 25 %
Wilkinson's Folding.....dis 25 @ 25&5 %

Drill Stocks.
Blacksmiths'.....each, $1.75
Blacksmiths' Self-Feeding.....each, $7.50, dis 20 %
Breast, P. S. & W.....dis 40&10 %
Breast, Wilson's.....dis 30&5 %
Breast, Millers Falls.....each, $3.00 dis 25 %
Breast, Bartholomew's... each, $2.50, dis 25&10 @ 40 %
Ratchet, Merrill's.....dis 20 @ 20 & 5 %
Ratchet, Ingersoll's.....dis 25 %
Ratchet, Parker's.....dis 20 @ 20&5 %
Ratchet, Whitney's.....dis 20&10 %
Ratchet, Weston's.....dis 20@25 %
Ratchet, Moore's Triple Action.....dis 25 @ 30 %
Whitney's Hand Drill, Plain, $11.00, Adjustable, $13.00.....dis 20&10 %
Wilson's Drill Stocks.....dis 1' %
Automatic Boring Tools.....each, $1.75 @ $1.85

Twist Drills—
Morse.....dis 50&10&5 %
Standard.....dis 50&10&5 %
Syracuse.....dis 50&10&5 %
Cleveland.....dis 50&10&5 %
Williams.....dis 50&10&10 %

Drill Bits.—See Augers and Bits.

Drill Chucks.—See Chucks.

Dripping Pans.
Small sizes.....₱ lb 7 ¢
Large sizes.....₱ lb 6½ ¢

Egg Beaters.
Dover.....₱ doz., $2.00
National.....₱ doz $4.50, dis 33⅓ %
Family (T. & S. Mfg. Co.).....₱ gro, $17.00@$18.00
Standard (Standard Co.).....₱ gro, $9.00
Kingston (Standard Co.).....₱ gro, $6.50
Acme (Standard Co.).....₱ gro, $6.00
Duplex (Standard Co.).....₱ gro, $18.00
Rival (Standard Co.).....₱ gro. $12.00
Triumph (T. & S. Mfg. Co.).....₱ gro, $10.50@$11.50
Advance No. 1.....₱ gro $10.50
Advance, No. 2.....₱ gro $10.00
Bryant's.....₱ gro $15.00
Ayres' Spiral.....₱ gro $5
Double (Hamblin & Russell Mfg. Co.).....₱ gro, $16 20
Navy (Hamblin & Russell Mfg. Co.).....₱ gro, $14.00
Triple (Hamblin & Russell Mfg. Co.).....₱ gro, $16.20
Spiral (Hamblin & Russell Mfg. Co.).....₱ gro, $4.50
Paine, Diehl & Co's.....₱ gro $24.00

Electric Bell Sets.—Wollensak's.....dis 15 %
Bigelow & Dowse.....dis 20 %

Emery.

	No. 4 to 46 gr.	No. 54 to 150 gr.	Flour, CF F FF.
Kegs, ₱ lb	4 ¢	5 ¢	2½¢
½ kegs, ₱ lb	4¼¢	5½¢	2¾¢
¼ kegs, ₱ lb	4½¢	5¾¢	3 ¢
10-lb cans, 10 in case	6 ¢	6½¢	5 ¢
10-lb cans, less than 10	10 ¢	10 ¢	7½¢

Enameled and Tinned Ware.—See Hollow-Ware.

Escutcheon Pins.
Iron, list Nov. 11, 1885.....dis 50&10 @ 50&10&5
Brass.....dis 60 @ 60&5 %

Escutcheons.
Door Lock.....Same discounts as Door Locks
Brass Thread.....dis 60 @ 60&10 %
Wood.....dis 25 %

Faucets.
Fenn's.....dis 40 %
Bohren's Patent Rubber Ball.....dis 25 %
Fenn's Cork Stops.....dis 33⅓ %
Star.....dis 60 @ 60&5 %
Frary's Patent Petroleum.....dis 40&10&2 %
West's Patent Key.....dis 50&10 %
Anchor Lock.....dis 45 %
Metallic Key, Leather Lined.....dis 55&10 @ 60&10 %
Cork Lined.....dis 70 @ 70&10 %
Burnside's Red Cedar.....dis 50 %
Burnside's Red Cedar, bb'. lots.....dis 50&10 %
J. Sommer's Best Block Tin Key.....dis 40 %
J. Sommer's Cork Lined, 1st quality.....dis 50 %
J. Sommer's Diamond Lock.....dis 40 %
J. Sommer's Perfection, Fla. Red Cedar.....dis 50 %
J Sommer's Goodenough Cedar.....dis 60 %
Self-Measuring, Enterprise...₱ doz $36.00—dis 20&10 %
Self-Measuring, Lane's.....₱ doz $36.00—dis 25&10 %
Self-Measuring, Victor.....₱ doz $36.00—dis 25&10 %

Felloe Plates......₱ lb 6 @ 6½¢

Fifth Wheels.—Derby and Cincinnati .dis 45&5 %

Files.
Domestic—
Nicholson Files, Rasps, &c..dis 50&15&5 @ 50&15&10 %
Nicholson (X. F.) Files.....dis 25 %
Nicholson's Royal Files (Seconds)dis 75 (extra prices on certain sizes.)
Other makers, best brands.....dis 60&5 @ 60&10&5 %
Fair grades.....dis 60&10&10 @ 70 %
Second quality.....dis 70&5 @ 75 %
Heller's Horse Rasps.....dis 50&7½ @ 50&10 %
McCaffrey's Horse Rasps.....dis 50&10 %
Imported—
J. & Riley Carr.....List, April 1, 1883, dis 15 %
J. & Riley Carr Horse Rasps.....dis 10 %
Moss & Gamble.....List April 1, 1883, dis 15 %
Butcher.....Butcher's list, dis 20 %
Stubs.....Stubs list, dis 25 @ 30 %
Turton's.....Turton's list dis. 20 @ 25 %
Grayson Horse Rasps.....American list .dis 60 %

Filing Machines.
Knox, 4½-inch Rolls.....$3.25 each } dis 35 %
Knox, 6-inch Rolls.....$5.60 each }
Eagle 3½-inch Roll.....$2.15, dis 35 %
Eagle, 5½-inch Roll.....2.85, dis 35 %
Crown, 4½ in., $3.50; 6-in, $4.00; 8-in., $6.50 each, dis 35 %
Crown Jewel.....4½-in., $2.50 each, dis 35 %
American, 5-in., $3; 6-in., $3.40; 7-in., $4.50 each, dis 35 %
Domestic Fluter.....$1.50 each, net
Geneva Hand Fluter, White Metal..₱ doz $12, dis 25 %
Crown Hand Fluter, Nos. 1, $15; 2, $12.50; 3, $10. dis 30 %
Shepard Hand Fluter, No. 85.....₱ doz $15.30, dis 40 %
Shepard Hand Fluter, No. 110.....₱ doz $11, dis 40 %
Shepard Hand Fluter, No. 95.....₱ doz $8, dis 40 %
Clark's Hand Fluter.....₱ doz $15.00, dis 35 %
Combined Fluter and Sad Iron...₱ doz $15.00, dis 30 %
Buffalo.....₱ doz $10.00 dis 10 %

Fluting Scissors......dis 45 %

Fly Traps.
Paragon.....₱ doz $1.50 @ 1.75

Forks.—Hay, Manure, &c., Asso. list.....dis 60&5 %
Hay, Manure, &c., Phila. list.....dis 60 @ 60&5 %
Plated, see Spoons.

Freezers, Ice Cream.
Buffalo Champion.....dis 60&10&5 %
Shepard's Lightning.....dis 60 %
White Mountain.....dis 60 %

Fruit and Jelly Presses.
Enterprise Mfg. Co.....dis 20&10 @ 30 %
Henis.....₱ doz $4.50
P. D. & Co.....₱ doz $4.50
Shepard's Queen City.....dis 40 %

Fry Pans.
High List.....dis 75&5 @ 75&10&5 %
No.....0 1 2 3 4 5 6 7 8
₱ doz. ..$3.75 4.70 5.30 5.95 6.55 7.50 8.75 10.00 11 25
Low List
No.....0 1 2 3 4 5 6 7 8
₱ doz.....$3.00 3.75 4.25 4.75 5.25 6 00 7.00 8.00 9.00

Fuse......₱ 1000 ft.
Common Hemp Fuse, for dry ground.....$2.70
Common Cotton Fuse, for dry ground.....2.85
Single Taped Fuse, for wet ground.....4.75
Double Taped Fuse, for very wet ground.....6.00
Triple Taped Fuse, for very wet ground.....7.25
Small Gutta Percha Fuse, for water.....7.50
Large Gutta Percha Fuse, for water.....12.00

Gauges.
Marking Mortise, &c.....dis 60&10 %
Wire, low list.....dis 10&10 %
Wire, Wheeler, Madden & Co.....dis 10 %
Wire, Morse's.....dis 50 @ 50&5 %
Wire, Brown & Sharpe's.....dis 10 @ 20 %

Gimlets.—Nail and Spike.....dis 50&10&5 %
"Eureka" Gimlets.....dis 40&10 %
"Diamond" Gimlets.....₱ gross $5.00
Double Cut, Shepardson's.....dis 45 @ 45&5 %
Double Cut, Ives'.....dis 60 @ 60&5 %
Double Cut, Douglass'.....dis 40&10 %
"Bee".....₱ gross $12, dis 25 @ 25&5 %

Glue.—Le Page's Liquid.....dis 25 @ 25&5%
Upton's Liquid.....dis 35 %

Glue Pots.
Tinned and Enameled.....dis 40&5 @ 40&10%
Family, Howe's "Eureka".....dis 40 %
Family, L. V. & C.'s "Handy".....dis 50 %

Grindstones
Small at factory.....₱ ton $7.50 @ 9.00

Grindstone Fixtures.
Sargent's Patent.....dis 70&10 %
Reading Hardware Co.....dis 30&10 %

Hack Saws.—See Saws.

Halters.—Covert's, Rope, ¼-in. Jute.....dis 50&2 %
Covert's, Rope, ¼ in., Hemp.....dis 40&2 %
Covert's Adj. Rope Halters.....dis 40&2 %
Covert's Hemp Horse and Cattle Ties.....dis 40&2 %
Covert's Jute Horse and Cattle Ties.....dis 60&10&2 %

Hammers.
Handled Hammers.
Maydole's.....List Dec. 1, 1885, dis 25 @ 25&1 0%
Buffalo Hammer Co.....
C. Hammond & Son.....
Humason & Beckley.....
Atha Tool Co.....
Fayette R. Plumb.....
} List Jan. 15, '87 Dis. 50 @ 50& 10 %
Verree.....dis 5 %
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75. dis 30&10 %
Nelson Tool Works.....dis 40&10 %
Warner & Nobles.....dis 20 @ 25 %
Peck, Stow & Wilcox.....dis 40 %
Sargent's.....dis 33⅓&10 %
Heavy Hammers and Sledges—
3 lb and under.....₱ lb 40¢
3 to 5 lb.....₱ lb 36¢ } ....dis 70 %
Over 5 lb.....₱ lb 30¢
Wilkinson's Smiths'.....10½¢ @ 11¢ ₱ lb

Hand Cuffs and Leg Irons.
Providence Tool Co., Hand Cuffs, $15.00 ₱ doz..dis 10%
Providence Tool Co., Leg Irons, $25.00 ₱ doz....dis 10%
Tower's.....dis 25 %
Daley's Improved Hand Cuffs: 2 Hands, Polished, ₱ doz, $48; Nickeled, $57; 3 Hands, Polished, ₱ doz. $72; Nickeled, $84.....dis 25 %

Handles.
Iron, Wrought or Cast.—
Door or Thumb.
Nos.....0 1 2 3 4
Per doz..$0.90 1.00 1.18 1.35 1.50....dis 60&10&10
Roggin's Latches.....₱ doz. 30¢ @ 35
Bronze Iron Drop Latches.....₱ doz. 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88.....net
Barn Door.....₱ doz. $1.40, dis 10&10 %
Chest and Lifting.....dis 70 %
Handles, Wood—
Saw and Plane.....dis 40&10 @ 40&10&5 %
Hammer, Hatchet, Axe, Sledge, &c.....dis 35 %
Brad Awl.....₱ gross $2.00
Hickory Firmer Chisel, assorted.....₱ gross 4.50
Hickory Firmer Chisel, large.....₱ gross 5.00
Apple Firmer Chisel, assorted.....₱ gross 5.00
Apple Firmer Chisel, large.....₱ gross 6.00
Socket Firmer Chisel, assorted.....₱ gross 3.00
Socket Framing Chisel, assorted.....₱ gross 5.00
} dis 40 @ 40&10 %
J. B. Smith Co.'s Fat. File.....dis 50 %
File.....₱ gross 2.75
Auger, assorted.....₱ gross 5.00
Auger, large.....₱ gross 7.00
} dis 40 @ 40&10 %
Patent Auger, Ives'.....dis 30&10 %
Patent Auger, Douglass'.....₱ set $1.25 net
Patent Auger, Swan's.....₱ set $1.00 net
Hoe, Rake, Shovel, &c.....dis 50&10 %
Cross Cut Saw Handles—
Atkins' No. 1 Loop, ₱ pair, 30¢ No. 3, 22¢; No. 2 and No. 4 Reversible, 22¢.
Boynton's Loop Saw Handles.....50¢, dis 60 %
Champion.....15¢

Hangers.
Barn Door, old patterns.....dis 60&10&10 @ 70 %
Barn Door, New England.....dis 60&10&10 @ 70 %
Samson Steel Anti-Friction.....dis 55
Orleans Steel.....dis 55 %
Hamilton Wrought Wood Track.....dis 55 %
U. S. Wood Track.....dis 65 %
Champion.....dis 60&10 %
Rider and Wooster, Medina Mfg. Co.'s list.....dis 70 %
Climax Anti-Friction.....dis 55 %
Climax Steel Anti-Friction.....dis 50 %
Zenith for Wood Track.....dis 55 %
Reed's Steel Arm.....dis 50 %
Challenge, Barn Door.....dis 50 %
Sterling Improved (Anti-Friction).....dis 55&10 %
Victor, No. 1, $15; No. 2, $16.50; No. 3, $18...dis 50&2 %
Cheritree.....dis 50&10 %
Kidder's.....dis 50&10 @ 60 %
The "Bos".....dis 60 %

Best Anti-Friction.....dis 60 %
Duplex (Wood Track).....dis 60 %
Terry's Patent.....₩ doz. pr.: 4 in. $10; 5 in., $12.....dis 50&5 %
Cronk's Patent....No. 4, $13; No. 5, $14.40; No. 6, $16.....dis 50&15 %
Wood Track Iron Clad.....₩ ft. 10¢, dis 50&15 @ 60 %
Carrier Steel Anti-Friction.....dis50 @ 50&5 %
Architect.....₩ set $6.00, dis 20 %
Eclipse.....dis 20&10
Felix.....₩ set $6.50, dis 20 %
Richards'.....dis30@30&10 %
Lane's Steel Anti-Friction.....dis 40&10 %
The Ball Bearing Door Hanger....dis 20&10 @ 25&10 %
Warner's Patent.....dis 20@20&10 %
Stearns' Anti-Friction.....dis 20 @ 20&10 %
Stearns' Challenge.....dis 25&10 @ 25&10&10 %
Faultless.....dis 40 @ 40&5 %
American.....₩ set $6; dis 20&10 %
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢.....dis 40 %
Paragon, Nos. 1, 2 and 3.....dis 40&10 %
Paragon, Nos. 5, 5½, 7 and 8.....dis 20&10 %
Crescent.....dis 60@60&10 %
Nickel Cast Iron.....dis 40&10 %
Nickel Malleable Iron and Steel.....dis 40 %
Scranton Anti Friction Single Strap.....dis 33⅓ %
Scranton Anti-Friction Double Strap.....dis 40 %
Universal Anti Friction.....dis 40 %
Wild West, 4 in. wheel, $15; 5 in. wheel, $21....dis 45 %

Harness Snaps.—See Snaps.

Hatchets.—List Jan. 1, 1886.

Isaiah Blood.....dis 35 @ 40%
Hunt's Shingling Lath and Claw.....dis 40&5 %
Hunt's Broad.....dis 40 %
Buffalo Hammer Co.....dis 40&10@50 %
Hurd's.....dis 40&10 @ 50 %
Fayette R. Plumb.....dis 40&10 @ 50 %
Wm. Mann, Jr., & Co.....dis 50 @ 50&5%
Underhill Edge Tool Co.....dis 40&5 @ 40&10 %
Underhill's Hainesand Bright goods.....dis 33⅓ %
C. Hammond & Son.....dis 40&10 @ 50 %
Simmons.....dis 40&10 @ 50 %
Peck's.....dis 40&10 @ 40&10&5 %
Kelly's.....dis 50@50&5 %
Sargent & Co.....dis 50 %
Ten Eyck Edge Tool Co.....dis 40&10@40&10&5 %
Collins, following list.....dis 10 %

Shingling,	Nos. 1 2 3	₩ doz	$5.50	$6.00 $6.50
Claw,	Nos. 1 2 3	₩ doz	6.00	6.50 7.00
Lathing	Nos. 1 2 3	₩ doz	5.50	6.00 6.50

Hay Knives.

Lightning.....Mfrs. price ₩ doz $18 dis 25 %; Jobber's Extras
Electric.....₩ doz $17; dis 30 @
Gem.....₩ doz $18; dis 30&5%
Wadsworth's.....dis 40&7½ @ 40&10 %
Carter's Needle.....₩ doz $11.50 @ $12.00
Heath's.....₩ doz $13.50 @ $14.00

Hinges.

Wrought Iron Hinges—
Strap and T.....dis 70&10 @ 70&10&5 %
Screw Hook and Strap, { 8, 10, 12 in., ₩ lb. 3½¢ / 14 to 36 in. ₩ lb. 2½¢
Heavy Welded Hook and Strap, { 8 to 12 in., ₩ lb. 3½¢ / 14 in. & up, ₩ lb. 2½¢
Screw Hook and Eye, { ¼ in. ₩ doz $1.50 / ⅜ in. ₩ doz $2.45 / ½ in. ₩ doz $3.80 } dis 10%
Rolled Blind Hinges, Nos 32 and 34.....dis 50&10
Rolled Blind Hinges, Nos. 232 and 234.....dis 55&10 %
Rolled Plate.....dis 70&10 %
Rolled Raised.....dis 70&10
Plate Hinges { 8, 10 & 12 in., ₩ lb. .5 / "Providence" } over 12 in., ₩ lb. .4½

Spring Hinges—
Geer's Spring and Blank Butts.....dis 40 %
Union Spring Hinge Co.'s list, March. 1886....dis 30 %
Acme and U. S.....dis 40 %
Empire and Crown.....dis 20 %
Hero and Monarch.....dis 50 %
American, Gem, and Star, Japanned.....dis 20 %
American, Gem, and Star, Bronzed.....net
Oxford, Bronze and Brass.....net
Barker's Double Acting.....dis 20&10 %
Union Mfg. Co.....dis 25 %
Bommer's.....dis 30
Buckman's.....dis 15@20 %
Chicago.....dis 30 %

Gate Hinges—
Western.....₩ doz $4.40, dis 55 %
N. E.....₩ doz $7.00, dis 55 %
N. E. Reversible.....₩ doz $5.20, dis 55&10 %
Clark's, Nos. 1 2 3.....dis 50&10&5 %
N. Y. State.....₩ doz $5.00, dis 55&10 %
Automatic.....₩ doz $12.50, dis 50 %
Common Sense.....₩ doz pair $4.50, dis 50 %
Seymour's.....dis 45&10 %
Shepard's, Nos. 1, 2 and 3.....dis 60& .0&5 %
Reed's Latch and Hinges.....₩ doz sets $12, dis 50

Blind Hinges—
Parker.....dis 75&2 %
Palmer.....dis 50&5&10 %
Seymour.....dis 70&2 %
Nicholson.....dis 45&10 %
Huffer.....dis 50 %
Clark's, Nos. 1, 3, 5, 10, 40 and 50.....dis 75&10&5&50 %
Clark's Mortise Gravity.....dis 50 %
Sargent's, Nos. 1, 3, 5, 11, 13....dis 75&10@75&10&5 %
Sargent's, No. 12.....dis 75&10&10 %
Reading's Gravity.....dis 75&10 @ 75&10&5 %
Shepard's "Noiseless." Nos. 50, 60, 65 & 55.....dis 75&10&5 %
Shepard's Niagara Gravity, Nos. 1, 3 and 5....dis 80 %
Shepard's Buffalo Gravity, Nos. 1, 3 and 5.....dis 80&2½ %
Shepard's Champion Gravity No. 75.....dis 80&2&5 %
Shepard's Steamboat Gravity, No. 10....dis 80&20 %
Shepard's Acme Lull & Porter....dis 75&5@75&10 %
Shepard's O. S. Lull & Porter.....dis 75&10 %
Shepard's "Queen City" Reversible.....dis 70&10 %
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....dis 75&10&2½ %
North's Automatic Blind Fixtures, No. 2, for Wood, $10.50; No. 3, for Brick, $13.50....dis 35&2 %

Hoes.

Handled—
Garden, Mortar, &c.....dis 65&5 %
Planter's, Cotton, &c.....dis 65&5 %
Warren Hoe.....dis 60 %
Magic.....₩ doz $4.75

Eye—
D. & H. Scovil.....dis 15 %
Lane's Crescent Scovil Pattern.....dis 45 %
Lane's Crescent Planters Pattern.....dis 45 & 5 %
Lane's Razor Blade, Scovil Pattern.....dis 50 %
Maynard. S. & O. Pat.....dis 45&5 %
Sandusky Tool Co., " " .....dis 60 %
Hubbard & Co., " " .....dis 60 %
Bare " " .....dis 60 %
Grub.....dis 60 @ 60&10 %

Hog Rings and Ringers.

Hill's Improved Ringers.....₩ dos. $4.50
Hill's Old Style Ringers.....₩ dos. $3.00
Hill's Tongs.....₩ dos, $4.50
Hill's Rings.....₩ dos boxes, $2.25 @ 2.40
Perfect Rings.....₩ dos boxes $1.75 @ 2.00
Perfect Ringers.....₩ dos $2.50
Blair's Hog Ringers.....₩ doz, $2.00 @ $2.25
Blair's Hog Rings.....₩ doz 90¢ @ 1.00
Champion Ringers.....₩ doz $2.00
Champion Rings, Double.....₩ doz, $2.25
Brown's Ringers.....₩ doz, $2.00
Brown's Rings.....₩ doz, $1.25 @ 1.50

Hoisting Apparatus.

"Moore's" Hand Hoist, with Lock Brake.....dis 70 %
"Moore's" Differential Pulley Block.....dis 40 %

Holders, File and Tool.

Rals Pat.....₩ doz $4; dis 25 %
Nicholson File Holders.....dis 20 %

Hollow-Ware.

Iron—
Stove Hollow-Ware. Ground...dis 60&10@60&10&5 %
Stove Hollow-Ware. Unground....dis 70&5&70&10 %
Enameled and Tinned Hollow-Ware—
Kettles.....dis 70 @ 70&5 %
Oval Boilers, Saucepans & Glue Pots.....dis 40&5 @ 40&10 %
Gray Enameled Ware.....dis 40 @ 40&5 %
Agate and Granite Ware.....dis 25 %
Rustless Hollow-Ware.....dis 50 @ 50&5 %
Galvanized Tea-Kettles—

Inch.....	6	7	8	9
Each....	55¢	60¢	65¢	75¢

Silver Plated—4 mo. or 5 % cash in 30 days.
Reed & Barton.....dis 40&5 %
Meriden Brittania Co.....dis 40&5 %
Simpson, Hall, Miller & Co.....dis 40&5 %
Rogers & Brother.....dis 40&5 %
Hartford Silver Plate Co.....dis 40&5&5 %
William Rogers Mfg. Co.....dis 40&5&5 %

Hooks.

Cast Iron—
Bird Cage. Sargent's list.....dis 60&10&10%
Bird Cage. Reading.....dis 60&10&10 %
Clothes Line. Sargent's list.....dis 60&10&10 %
Clothes Line. Reading list. dis 60&10 @ 60&10&10 %
Ceiling. Sargent's list.....dis55&10&10 %
Harness. Reading list.....dis 55&10 @ 55&10&10 %
Coat and Hat. Sargent's list.....dis 55&10 %
Coat and Hat. Reading.....dis 60&10 @ 50&10&10 %

Wrought Iron—
Cotton.....₩ doz $1.25
Cotton Pat. (N. Y. Mallet & Handle W'ks).....dis 30 %
Tassel and Picture (T. & S. Mfg. Co.).....dis 50 %
Wrought Staples, Hooks, &c.....See Wrought Goods
Bench Hooks.....See Bench Stops

Wire—
Wire Coat and Hat, Gem, list April, 1886....dis 45 %
Wire Coat and Hat. Miles', list April, 1886....dis 45 %
Indestructible Coat and Hat.....dis. 45 %
Wire Coat and Hat, Standard.....dis 45 %
Belt.....dis 75&10 @ 80 %
Grass.....₩ doz $2.00
Bush.....dis 55 @ 60 %
Whiffletree—Patent.....dis 55 %
Hooks and Eyes—Malleable Iron.....dis 70 @ 70&10 %
Hooks and Eyes—Brass.....dis 60&10&10 %
Fish Hooks, American.....dis 50 %

Horse Nails.

Nos.	6	7	8	9	10	
Ausable	28¢	26¢	25¢	24¢	23¢	dis 25&10@25&10&10 %
Clinton. Fin.	24¢	22¢	21¢	20¢	19¢	dis 40&10 @ 50 %
Essex	28¢	26¢	25¢	24¢	23¢	dis25&10@25&10&10 %
Lyra	26¢	23¢	22¢	21¢	20¢	dis 40&10&@50 %
Snowden	26¢	23¢	22¢	2.¢	20¢	dis 40&10&@50 %
Putnam	24¢	22¢	21¢	20¢	19¢	dis 5&10&2½&2½ %
Vulcan	23¢	21¢	20¢	19¢	18¢	dis 12½&5 %
Northwest'n.	25¢	23¢	22¢	21¢	20¢	dis 10&10&5 %
Globe	23¢	21¢	20¢	19¢	18¢	dis 12½&5&5 %
A. C	25¢	23¢	22¢	21¢	20¢	dis 25&10 @ 33⅓&5 %
C. B.-K	25¢	23¢	22¢	21¢	20¢	dis 25&10 @ 33⅓&5 %
Champlain	25¢	26¢	25¢	24¢	23¢	dis25&10&10 %
New Haven	28¢	26¢	25¢	24¢	23¢	dis25&10@25&10&10 %
Saranac	25¢	23¢	22¢	21¢	20¢	dis 20&10 %
Champion	25¢	23¢	23¢	21¢	20¢	dis 10&10&10 %
Capewell	25¢	26¢	25¢	24¢	23¢	dis 35&5 @ 35&10 %
Star	23¢	21¢	20¢	19¢	18¢	dis 10&10&12½&5 %
Anchor	23¢	21¢	20¢	19¢	18¢	dis 35 %
Western	28¢	21¢	20¢	19¢	18¢	dis 40&10 %
Empire Bronzed						1¢ per lb.

Horse Shoes.—See Shoes, Horse.

Hose, Rubber, competition.....75&10 & 80 %
Standard.....dis 70&7 &10 %
Extra.....dis 60 %
N. Y. B. & P. Co., Para.....dis 30&10 %
N. Y. B. & P. Co., Extra.....dis 50 %
N. Y. B. & P. Co., Dundee.....dis 60&10&5 %

Ice Picks, Chisels, &c.

Am. Ice Chisel Pol'd. ...₩ doz $3.00, dis 2 @20&5 %
National Ice Chisel.....₩ doz $6.25, dis 20 %
Novelty Ice Breakers.....₩ doz $6.25, dis 20 %
Dunlap's Ring Picks.....₩ doz $2.00, dis 15 %
Wood Head Picks. Sargent's...₩ doz $1.60, dis 50&10 %
Iron Head Picks. Sargent's.....₩ doz $1.35, dis 50&10 %
Ice Mallets, Pick in handle.....₩ doz $2.00, dis 15 %
Ice Axes, Small Cast or Mail...₩ doz $1.25, dis 20&10 %
Combination Ice Tools.....₩ doz $2.00 net
Acme Ice Pick and Tongs...₩ gross $55.00, dis 50&10 %
Roger's Lightning Ice Chisel.....₩ gross $28.50

Ice Tongs.

Champion, S. S. & Co.....₩ doz $4.00, dis 25&10 %
Family.....₩ doz $2.75, dis 20@25 %

Jack Screws.—See Screws.

Kettles.

Brass. 7 to 17 in., ₩ lb.	Spun. 24¢	Stamped. 21 ¢
Brass larger than 17 inches, ₩ lb.	26¢	23½¢

Enameled and Tea Kettles.....See *Hollow-Ware*

Keys.

Lock Asso'n list Dec. 20, 1886.....dis 50&10 @ 60&5 %
Eagle. Cabinet, Trunk and Padlock.....dis 33⅓&2 %
Hotchkiss' Brass Blanks.....dis 40 %
Hotchkiss' Copper and Tinned.....dis 40 %
Hotchkiss' Padlock and Cabinet.....dis 35 %
Ratchet Bed Keys.....₩ doz $4.00, dis 15 %

Knife Sharpeners.

Parkin's Applewood Handles.....₩ doz $6.00, dis 40 %
Parkin's Rosewood or Cocobolo...₩ doz $9.00, dis 40 %

Knives.

Wilson's Butcher Knives.....dis 20 @ 25 %
Ames' Butcher Knives.....dis 25 %
Nichols' Butcher Knives.....dis 40&10
Ames' Shoe Knives.....dis 20@25 %
Ames' Bread Knives.....₩ doz $1.50, dis 15 @ 20 %
Moran's Shoe and Bread Knives.....dis 20 %
Hay and Straw.....See Hay Knives
Table and Pocket.....See Cutlery

Knobs.

Door Mineral.....65@68¢
Door Por. Jap'd.....75@75¢
Door Por. Por. Nickel.....$2.00 @ 2.25
Door Por. Plated, Nickel.....$2.00 @ 2.25
Drawer, Porcelain.....dis 55&10&10@5&10&10 %
Hematite Door Knobs, new list.....dis 40&10@50 %
Yale & Towne Wood Knobs, list Dec., 1885....dis 40 %
Furniture Plain.....75¢ gross inch. dis 10 %
Furniture, Wood Screws.....dis 25&10 %
Base. Rubber Tip.....dis 70&10&5 %
Picture, Judd's.....dis 60&10&10 @ 70 %
Picture, Sargent's.....dis 60&10&10 %
Picture, Hematite.....dis 35&5 %
Shutter, Porcelain.....dis 65&10 %
Carriage. Japanned.....₩ gross 80¢, dis 60&10 %

Ladies.

Melting, Sargent's.....dis 55&10%
Melting, Reading.....dis 35&10%
Melting, Monroe's Patent.....₩ doz. $4.00, dis 40%
Melting, P. S. & W.....dis 35&10 @ 40%
Melting, Warner's.....dis 30%

Lawn Mowers.

Standard List.....dis 50&10 %
Enterprise.....dis 60&10 %

Lanterns.

Tubular, Plain with Guards.....₩ doz $4.00 @ $4.25
Tubular, Lift Wire, with Guards...₩ doz $4.00 @ $4.75
Tubular, Square Plain with Guards, ₩ doz $4.25 @ $4.25
Tubular, Sq. Lift Wire with Guards, ₩ doz $4.50 @ $4.75
Without Guards, 25¢ ₩ dozen less.
Police, Small, $6.00; Med. $7.25; Large, $9.75. dis 20@25%

Lemon Squeezers.

Porcelain Lined, No. 1.....₩ doz. $6.00, dis 25&30 %
Wood, No. 2.....₩ doz. $3.00, dis 35 %
Wood, Common.....₩ doz $1.70 @ 1.75
Dunlap's Improved.....₩ doz. $3.75, dis 20 %
Sammis'.....No. 1, $5; 2, $4; 12, $13 ₩ doz. dis 25&10 %
Jennings' "Star".....₩ doz $2.50
The "Boss".....₩ doz $2.50
Dean's.....Nos. 1, ₩ doz $6.50; 2, $5.25; 3, $1.90
Little Giant.....dis 50 @ 50&5 %
King.....dis 40&5 %

Lines.

Cotton and Linen Fish, Draper's.....dis 50 %
Draper's Chalk.....dis 60 %
Draper's Mason's Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25.....dis 25 %
Cotton Chalk.....dis 55 %
Samson, Cotton, No. 4, $3; No. 4½, $2.50.....dis 10 %
Silver Lake, Braided, Nos. 0, $6.00. No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₩ gross.....dis 25 %
Masons' Linen, No. 3½, $1.50; No. 4, $2; No. 4½, $2.50
Masons' Colored Cotton.....dis 45
Wire Clotnes, No. 18, $3.60; No 19, $3.00; No. 20, $2.50.
Ventilator Cord, Samson Braided, White or Drab Cotton.....$7.50 ₩ doz. dis 20%

Locks. Padlocks. Cabinet Locks, &c.

Door Locks, Latches, &c.—
List. Dec. 30, '86, chgd Feb. 2, '87...dis 50&10 @ 60&5 %
Note.—Lower net prices often made.
Sargent & Co. (list Feb. 1, 1888).....dis 50&10&2 %
Reading Hardware Co. (list Feb. 2, '88).dis 55@60&10 %
Livingston & Co.....dis 70 %
Perkins' Burglar Proof.....dis 60&25 %
Plate.....dis 33⅓&2 %
F. Many's "Extension Cylinder".....$10.50 ₩ doz
Barnes Mfg. Co.....dis 40 %
Yale Corrugated Key.....dis 33⅓&5
Dietz Flat Key.....dis 30 %
L. & C. Round Key Latches.....dis 30&10 %
L. & C. Flat Key Latches.....dis 33⅓&10 %
Romer's Night Latches.....dis 15 %
Yale new list.....dis 33⅓&5
"Shepardson" or "U. S.".....dis 35%
"Felter" or "American".....dis 40&10 %
Reed's N. Y. Haap Lock.....dis 25 %

Cabinet—
Eagle, Gaylord Parker and Corbin, { List March, '84, revised Jan. 1, '85.dis 33⅓&2 %
Deitz, Nos. 36 to 39.....dis 40 %
Deitz, Nos. 51 to 63.....dis 40 &10 %
Dietz, Nos. 86 to 96.....dis 30 %
Stoddard Lock Co.....dis 30 @ 33⅓ %
'Champion" Night Latches.....dis 40 %
Barnes Mfg. Co.....dis 40 %
Eagle and Corbin Trunk.....dis 35&2 %
Champion" Cabinet and Combination....dis 33⅓ %
Yale.....dis 33⅓ %
Romer's.....dis 25 %

Padlocks—
List, Dec. 23, 84.....dis 65&10&2@—%
Yale Lock Mfg. Co.'s.....dis 33⅓ %
Eagle.....dis 25&2 %
Eureka, Eagle Lock Co.....dis 40&2 %
Romer's. Nos. 0 to 91.....dis 20 %
Romer's Scandinavian, &c, Nos. 100 to 505...dis 15 %
A. E. Dietz.....dis 40 %
"Champion" Padlocks.....dis 40 %
Hotchkiss.....dis 30 %
'Star".....dis 45 %
"Horse Shoe." ₩ doz.. $9.....dis 40 %
Barnes Mfg. Co.....dis 40 %
Nock's.....dis 30 %
Brown's Patent.....dis 25 %
Scandinavian.....dis90 %
Fraim's (Scandinavian new list dew).....dis 60 %

Lumber Tools.

Ring Peavies, "Blue Line" Finish.....₩ doz $20.00
Ring Peaves, Common Finish.....₩ doz $18.00
Steel Socket Peavies.....₩ doz $21.00
Mail. Iron Socket Peavies.....₩ doz $19.00
Cant Hooks, "Blue Line" Finish.....₩ doz $16.00
Cant Hooks, Common Finish.....₩ doz $14.00
Cant Hooks, Mail. Socket Clasp, "Blue Line" Finish.....₩ doz $18.00
Cant Hooks, Mail. Socket Clasp Common Finish.....₩ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Fin. ₩ doz $14.00
Cant Hooks, Clip Clasp, Common Finish..₩ doz $12.00
Hand Spikes.....₩ doz 6 ft., $15.00; 8 ft., $20
Pike Poles, Pike & Hook, 12 ft. 14 ft. 16 ft. 18 ft. 20 ft. ₩ doz.....$11.50 12.50 14.50 17.50 21.50
Pike Poles, Pike only, ₩ doz.....10.00 11.00 13.00 16.00 20.00
Pike Poles not Ironed, ₩ doz.....6.00 7.00 9.00 12.00 16.0
Setting Poles, ₩ doz.....14.00 15.00 17.00
Swamp Hooks.....₩ doz $18.00
Landing Blocks.....₩ doz $22.50
Skidding Tongs.....₩ doz $51.00
Log Binders.....₩ doz $26.00
Sended Boot Calks, 1 to 5 M, dis 25 %; 5 to 10 M, dis 30 %
Square Steel Boot Calks.....dis 40 %
Chain Rafting Dogs.....₩ 100 $12.50
Ring Rafting Dogs...₩ 100, med., $10.00; large, $12.00
Timber Grapples.....₩ doz $30.00

Lustre.

Four-ounce Bottles.....₩ doz. $1.75 ₩ gro. $17. 00

Mallets.

Hickory.....dis 20&10@20&10&10 %
Lignumvitæ.....dis 20&10@20&10&10 %
B. & L. Block Co, Hickory and L. V...dis 30 @ 30&10 %

Match Safes.

Dangerfield's Self-Igniting.....₩ doz $1.25

Mattocks.—Regular list.....dis 60&5 @ 60&10 %

Meat Cutters.

Dixon's—Nos.	1	2	3	4	
₩ doz	$14.00	17.00	19.00	30.00	dis 45 %
Woodruff's	Nos.	100	150		
	₩ doz.	$15.00	18.00		dis 45 %
Champion. Nos.	200	300	400		
₩ doz.	$22.00	$7.00	40.00		dis 45 %
Hales' Pattern Nos.	11	12	13		
₩ doz...	$27.00	33.00	45.00		dis 70 @ & 5 %

American.....dis

Nos.	1	2	3	4B	
Each	$5.00	7.00	10.00	25.00	50.00 60.00

Enterprise.....dis 30 %

Nos.	10	12	22	32	42
Each	$3	2.50	4.00	6 00	15.00

Pennsylvania.....dis 40&10%
Nos. 1 2 3 00
₩ doz. $24.00 28.00 36.00 28.00
Miles' Challenge..Nos. 1 2
₩ doz. $22.00 30.00 40.00—dis 45@45&10 %
Home No. 1.....$26 ₩ doz, dis 55&10 %
Draw Cut..Nos. 5 2 6 8
Each....$50.00 75.00 80.00 225.00—dis 20 @ 25 %
Beef Shavers (Enterprise Mfg. Co.)...dis 20&10 @ 30 %
Chadborn's Smoked Beef Cutter.....₩ doz. $66.00

Mincing Knives.
Am. (2d quality), ₩ gro, 1 blade, $7; 2 blades, $12; 3 blades, $18.....net
Lothrop's.....dis 20&10 %
Smith's, ₩ doz, Single, $2.00; Double, $3....dis 40@45 %
Knapp & Cowles.....dis 50&10@60 %
Buffalo Adjustable.....₩ doz $3.00, dis 25 %

Molasses Gates.—Stebbins' Pat..dis 70@70 & 7½ %
Stebbins' Genuine.....dis 60&10&10 %
Stebbins' Tinned Ends.....dis 40&10 %
Chase's Hard Metal.....dis 50&10 %
Bush's.....dis 20 %
Lincoln's Pattern.....dis 66⅔&10 %
Weed's.....dis 20&10 %
Boss Nos. 1 2 3 4
$7.00 8.00 9.00 10.00 ₩ doz, dis 60&10&10 %

Money Drawers.—₩ dos., $18 @ $20.

Muzzles.—Safety, ₩ doz. $3.....dis 25 %

Nails.....See Trade Report
Wire Nails & Brads, list July 14, '87..dis 70@70&5 %
Wire Nails, Standard Penny.....₩ keg, $2.60 @ $2.65

Nail Puller.—Curtiss Hammer...₩ doz $9.00 net
Giant, No. 1.....₩ doz $30.00, dis 10 %
Pelican.....₩ doz $9.00, dis 25 %
Boss.....₩ doz $30, dis 30 %

Nail Sets.—Square.....₩ gro., $4.00 @ $4.25
Round.....₩ gro., $3.25
Cannon's Diamond Point.....₩ gro. $12 dis 20 %

Nut Crackers.
Table (Humason & Beckley Mfg. Co.).....dis 40 %
Blake's Pattern.....₩ doz $2.00, dis 10 %
Turner & Seymour Mfg. Co.....dis 50 %

Nuts.
Nuts, all kinds, 5¢ off list Jan. 1, 1888.
In lots less than 100 ℔, ₩ ℔, add ½¢, 1 ℔ boxes add 1¢ to list.

Okum.
Government.....₩ ℔ 8¼¢
U. S. Navy.....₩ ℔ 7¢ @ 7¼¢
Navy.....₩ ℔ 6¢ @ 6¼¢

Oilers.—Zinc and Tin.....dis 65 @ 65&10 %
Brass and Copper.....dis 50&10@50&10&5 %
Malleable, Hammers' Improved, No 1, $5.00; No. 2, $4.00; No. 3, $4.40 ₩ doz.....dis 10 @ 10&10 %
Malleable, Hammers, Old Pattern, same list....dis 40 %
Prior's Patent or "Paragon" Zinc.....dis 60&10&10 %
Prior's Patent or "Paragon" Brass.....dis 50 %
Olmstead's Tin and Zinc.....dis 60 %
Olmstead's Brass and Copper.....dis 50 %
Broughton's Zinc.....dis 60 %
Broughton's Brass.....dis 50 %

Packing, Steam.

Rubber—
Standard.....dis 60&10 @ 60&10&10 %
Extra.....dis 50&10 @ 60 %
N. Y. B. & P. Co., Standard.....dis 50&10&5 %
N. Y. B. & P. Co., Empire.....dis 70 %
N. Y. B. & P. Co., Salamander.....₩ ℔ 65¢, dis 30 %
Jenkins' Standard.....₩ ℔ 80¢, dis 35 %

Miscellaneous—
American Packing.....10¢ @ 11¢ ₩ ℔
Russia Packing.....14¢ ₩ ℔
Italian Packing.....13 @ 14¢ ₩ ℔
Cotton Packing.....15 @ 17¢ ₩ ℔
Jute.....7 @ 8¢ ₩ ℔

Padlocks.—See Locks.

Pails.
Galvanized Iron—
Quarts. 10 12 14
Hill's Light Weight, ₩ doz.....$2.75 3.00 3.25
Hill's Heavy Weight, ₩ doz.....3.00 3.25 3.75
Whiting's.....2.75 3.00 3.25
Sidney Shepard & Co.....2.67 .... 3.23
Iron Clad.....2.75 3.00 3.25
Fire Buckets.....2.74 3.25 3.50
Buckets, see Wall Buckets

Indurated Fibre Ware—
Star Pails, 12 qt.....₩ doz $4.50
Fire, Stable and Milk, 14 qt.....₩ doz $5.50

Pencils. Faber's Carpenters'.....high list, dis 50 %
Faber's Round Gilt.....₩ gro $5.25 net
Dixon's Lead.....₩ gro $4.50 net
Dixon's Leader.....₩ gro $6.75 net
Dixon's Carpenters'.....dis 40&10 %

Picks.
Railroad, 5 to 6, $12.00; 6 to 7, $13.....dis 60 @ 60&10 %
Adze Eye, 5 to 6, $12.00; 6 to 7, $13.....dis 60 @ 60&10 %

Picture Nails.
Brass Head, Sargent's list.....dis 50&10&10 %
Brass Head, Combination list.....dis 50&10 %
Porcelain Head, Sargent's list.....dis 50&10&10 %
Porcelain Head, Combination list.....dis 40&10 %
Miles' Patent.....dis 40 %

Pinking Irons......₩ doz 65¢ net

Pipe, Wrought Iron.—List March 23, 1887.
1¼ and under, Plain.....dis 55&5 %
1¼ and under, Galvanized.....dis 50 %
1½ and over, Plain.....dis 65&5 %
1½ and over, Galvanized.....dis 55 %
Boiler Tubes, Iron.....dis 55 @ 60 %

Planes and Plane Irons.
Wood Planes—
Molding.....dis 50 @ 50&5 %
Bench, First Quality.....dis 50&10 @ 60 %
Bench, Second Quality.....dis 60&10 %
Bailey's (Stanley R. & L. Co.).....dis 30&10 %
Iron Planes—
Bailey's (Stanley R. & L. Co.)...dis 30&10@30&10&5 %
Miscellaneous Planes (Stanley R. & L. Co.dis 20&10 %
Victor Planes (Stanley R. & L. Co.)... dis 20& 10 %
Steer's Iron Planes.....dis 35 @ 35&5 %
Meriden Mal. Iron Co.'s.....dis 30&10@30&10&10 %
Davis's Iron Planes.....dis 30&10&30&10&10 %
Birmingham Plane Co.....dis 50@50&5 %
Gage Tool Co.'s Self-Setting.....dis 20 %
Chaplin's Iron Planes.....dis 40 @ 40&5 %
Plane Irons—
Plane Irons.....dis 20&10 %
Plane Irons, Butcher's.....$5.00 @ $5.25 to £
Plane Irons, Buck Bros.....dis 30 %
Plane Irons, Auburn Tool Co.'s "Thistle".....dis 40 %
Plane Irons, Middlesex Mfg. Co., "Baldwin Iron," Single and Cut.....dis 20 @ 25 %
Double.....dis 33⅓ @ 40 %
L. & I. J. White.....dis 25 %

Pliers and Nippers.
Button's Patent.....dis 30&10 @ 40 %
Hall's Pat. Compound Lever Cutting Nippers, No. 9, 5 in., $13.50; No. 4, 7 in., $21.00 ₩ doz.dis 20&10@33⅓ %
Humason & Beckley Mfg. Co.....dis 50@50&7½ %
Gas Pliers.....dis 60 %
Gas Pliers, Custer's Nickel Plated.....dis 60&5 %
Eureka Pliers and Nippers.....dis 40 %
Russell's Parallel.....dis 25 %
P. S. & W. Cast Steel.....dis 50 %
P. S. & W. Tinners' Cutting Nippers....add 6 % dis 10 %
Carew's Pat. Wire Cutters.....dis 20 %
Morrill's Parallel, per doz., $12.....dis 40 %
Cronk's 8 in., $15; 10 in., $21.....dis 40 @ 40&5 %

Plumbs and Levels.
Regular List.....dis 70&10@70&10&10 %
Disston's.....dis 45&10 %
Pocket Levels.....dis 70&10@70&10&10 %
Davis Iron Levels.....dis 30 %
Davis' Inclinometers.....dis 10&10 %

Poppers, Corn.
Round or Square, 1 qt.....₩ gro $10.50 @ $12
Round or Square, 2 qt.....₩ gro $28.50 @ $24

Post Hole and Tree Augers and Diggers.
Samson Post Hole Digger.....₩ doz $36.00, dis 25&10 %
Fletcher Post Hole Augers.....₩ doz $36.00, dis 20 %
Eureka Diggers.....₩ doz $16 @ $17
Leed's.....₩ doz $8.00 @ $9.00
Vaughan's Post Hole, Auger, per doz...$13 00 @ $14.00
Kohler's Little Giant.....₩ doz $18.00
Kohler's Hercules.....₩ doz $15.00
Kohler's New Champion.....₩ doz $9.00
Schneidler.....₩ doz $18
Ryan's Post Hole Diggers.....₩ doz $24
Cronk's Post Bars.....doz $66, dis 50&5 @ 50&10 %
Gibb's Post Hole Digger, ₩ doz $30....dis 40 @ 40&10 %

Potato Parers.
White Mountain.....₩ doz $5.00 @ 5.50
Antrim Combination.....₩ doz $8.00
Hoosier.....₩ doz $13.50

Pruning Hooks and Shears.
Disston's Combined Pruning Hook and Saw, ₩ doz $18.00.....dis 20&10 %
Disston's Pruning Hook.....₩ doz $12.00, dis 20&10 %
E. S. Lee & Co.'s Prunin Tools.....dis 40 %
Pruning Shears, Henry's Pat...₩ doz $3.75 @ $4.00 net
Henry's Pruning Shears.....₩ doz $4.25 @ $4.50 net
Wheeler, M. & Co.'s Combination...₩ doz $12, dis 20 %
Dunlap's Saw and Chisel.....₩ doz $8.50, dis 30 %
J. Mallinson & Co.....No. 1, $5.25; No. 2, $7.25

Pulleys.—Hot House, Awning, &c.....dis 60&10 %
Japanned Screw.....dis 60&10 %
Brass Screw.....dis 60&10 %
Japanned Side.....dis 66⅔&10 %
Japanned Clothes Line.....dis 60&10 %
Emp'ire Sash Pulley.....dis 55 @ 60 %
Moore's Sash, Anti Friction.....dis 50 %

Hay Fork, Solid Eye, $4.00; Swivel, $4.50{ dis 50&10&5 %

Hay Fork, "Anti-Friction," 5 in. Solid, $5.70.....dis 50 %
Hay Fork, "F" Common and Pat. Bushed.....dis 20 %
Hay Fork, Tarbox Pat. Iron.....dis 30 %
Hay Fork, Reed's Self-Lubricating.....dis 60 %
Shade Rack.....dis 45 %
Tackle Blocks.....See Blocks

Pumps.—Cistern, Best Makers.....dis 50 & 10&60 %
Pitcher Spout, Best Makers...dis 60&10 @ 60&10&10 %
Pitcher Spout, Cheaper Goods..dis 70&5 @ 70&10&5 %

Punches.
Saddlers' or Drive, good quality.....₩ doz 60¢ @ 65¢
Bemis & Call Co.'s Cast Steel Drive.....dis 50&5 %
Bemis & Call Co.'s Springfield Socket.....dis 50&5 %
Spring, good quality.....₩ doz $2.50 @ $2.60
Spring, Leach's Patent.....dis 15 %
Bemis & Call Co.'s Spring and Check.....dis 40 %
Solid Tinners'.....₩ doz $1.44, dis 55 %
Tinners' Hollow Punches.....dis 90&2 %
Rice Hand Punches.....dis 15 %

Rail. Sliding Door, Wrt. Brass ₩ ℔ 35¢.....dis 15 %
Sliding Door, Bronzed Wrt. Iron.....₩ foot 7¢
Sliding Door Iron, Painted....₩ foot 4¢, dis 20&10&5 %

Barn Door, Light....Inch. ½ ⅝ ¾
Per 100 feet..... $2.50 3.00 4.40—dis 10 %

S L for N E. Hangers—

	Small.	Med.	Large
Per 100 feet	$2.15	2.70	3.25 net

Terry's Wrought Iron, ₩ foot.....4½¢ @ 5¢
Victor Track Rail, 7¢ ₩ foot.....dis 50&2 %
Carrier Steel Rail, per foot.....4½¢

Rasps.
Cast steel.....dis 65&5 @ 70 %
Malleable.....dis 70 @ 70&5 %
Gibbs Lawn Rake.....$12, dis 40 %
Canton Lawn Rake.....$9, dis 40 %
Ft. Madison Prize Bow Brace and Peerless..dis 65&5 %
Fort Madison Steel Tooth Lawn Rake, $6.....dis 25 %

Razors.—J. R. Torrey Razor Co.....dis 20%
Wostenholme and Butcher.....$10 to $, dis 10 %

Razor Strops.
Genuine Emerson.....dis 60 @ 60&5 %
Imitation Emerson.....₩ doz $2.00, dis 20&10&5 %
Torrey's.....dis 20 %
Badger's Belt and Combination.....₩ doz $2
Lamont Combination.....₩ doz $4

Rivets and Burrs.
Copper.....dis 50, with Jobbers' Extras.
Iron, list November 17, 1887.....dis 50 %

Rivet Sets.....dis 50&2 @ 50&10 %

Rods.—Stair, Brass.....dis 2&2 %
Stair, Black Walnut.....₩ doz 40¢

Rollers.
Barn Door, Sargent's list.....dis 60&10&10 %
Acme (Anti-Friction).....dis 55 %
Union Barn Door Roller.....dis 70 %

Rope.—Manufacturers' prices for large lots.

Manila	⅝ inch and larger	₩ ℔ 10¾¢ net
Manila	½ inch	₩ ℔ 11¼¢ net
Manila	⅜ and 5-16 inch	₩ ℔ 11¾¢ net
Manila Tarred Rope		₩ ℔ 10¼¢ net
Manila, Hay Rope		₩ ℔ 10¾¢ net
Sisal	⅝ inch and larger	₩ ℔ 8½¢ net
Sisal	½ inch	₩ ℔ 9 ¢ net
Sisal	⅜ and 5-16 inch	₩ ℔ 9½¢ net
Sisal, Hay Rope		₩ ℔ 8½¢ net
Sisal, Tarred Rope		₩ ℔ 8 ¢ net
Sisal, Medium Lath Yarn		₩ ℔ 7½¢ net

Discount 1½% for cash in 10 days.

Cotton Rope.....₩ ℔ 15 @ 18¢ net
Jute Rope.....₩ ℔ 7¢

Rules.
Boxwood.....dis 30&10 @ 30&10&10 %
Ivory.....dis 50 @ 50&10 %

Sad Irons.
From 4 to 10, at factory.....₩ 100 ℔ $2.50 @ $2.65
Self-Heating.....₩ doz. $9.00 net
Self-Heating, Tailors'.....₩ doz. $18.00 net
Gleason's Shield and Toilet.....dis 25 %
Mrs. Pott's Irons.....dis 40@40&5 %
Enterprise Star Irons, new list, July 20, 1882....dis 40 %
Combined Fluter and Sad Iron...₩ doz. $15.00, dis 15 %
Fox Reversible, Self Fluter.....₩ doz., $24.00 net
Chinese Laundry (N. E. Butt Co.).....8¼¢, dis 15 %
New England.....5¢, dis 15 %
Mahony's Troy Pol. Irons.....dis 25 %

Sand and Emery Paper and Cloth.
List April 19, 1886.....dis 20@20&5 %
Sibley's Emery and Crocus Cloth.....dis 30 %

Sash Cord.
Common.....₩ ℔, 10¢ @ 11¢
Patent, good quality.....₩ ℔, 13¢ @ 13½¢
White Cotton Braided, fair quality.....₩ ℔ 28¢ @ 29¢
Common Russia Sash.....₩ ℔ 13½¢
Patent " " .....₩ ℔ 15¢
Cable Laid Italian " .....₩ ℔ 22¢ @ 23¢
India Cable Laid " .....₩ ℔ 13¢
Silver Lake, A Quality, White.....50¢, dis 10&10&5 %
Silver Lake, A Quality, Drab.....55¢, dis 10&10&5 %
Silver Lake, B Quality, White.....50¢, dis 20&10&5 %
Silver Lake, B Quality Drab.....55¢, dis 20&10&5 %
Silver Lake, C Quality, White (only).....27¢ @ 28¢
Sylvan Spring, Extra Braided, White.....34¢
Sylvan Spring, Extra Braided, Drab.....30¢
Semper Idem, Braided, White.....30¢
Egyptian, India Hemp, Braided.....25¢
Samson, Braided, White Cotton....50¢ dis 30 @ 30&5 %
Samson, Braided, Drab Cotton....55¢ dis 30 @ 30&5 %
Samson, Braided Italian Hemp....55¢ dis 30 @ 30&5 %
Samson Braided Linen.....50¢ dis 30 @ 30&5 %

Sash Locks.
Clark's No. 1, $10.00; No. 2, $8.00 ₩ gross.....dis 33⅓ %
Ferguson's.....dis 33⅓ %
Morris and Triumph, list Aug. 16, 1886.....dis 60&2 %
Victor.....60&10&2 %
Walker.....dis 10 %
Attwell Mfg. Co.....dis 25 @ 33⅓ %
Reading.....dis 66⅔&10 @ 66⅔&10&10 %
Hammond's Window Springs.....dis 40 %
Common Sense, Jap'd, Cop'd and Br'sed..₩ gross $4.50
Common Sense, Nickel Plated.....₩ gross $10.00
Universal.....dis 30 %
Kemshall's Gravity.....dis 60 %
Kempshall's Model.....dis 60@60&10 %
Corbin's Daisy, list February 15, 1886.....dis 70 %
Payson's Perfect.....dis 60 @ 60&10 %
Hugunin's New and Improved Adjustable Sash Balances, list Jan. 5, 1887.....dis 25&7&2 %
Hugunin's New Sash Locks, list Jan. 5, '87.dis 25&5&2 %
Stoddard "Practical".....dis 10 %
Ives Patent.....dis 60 %
Lieschе's Nos. 100 & 110, ₩ gro. $8; 105, $10..dis 20&10 %
Davis, Bronze, Barnes Mfg. Co.....dis 50 %
Champion Safety, List March 1, 1888....dis 35@55&5&5 %

Sash Weights.
Solid Eyes.....₩ ton. $25

Sausage Stuffers or Fillers.
Miles' "Challenge".....₩ dos. $20, dis 50@50&5 %
Perry.....₩ dos. No. 1, $15; No. 0, $21, dis 50@50&5 %
Draw Cut No. 4.....each, $30.00, dis 20 %
Enterprise Mfg. Co.....dis 20&10 @ 30 %
Silver's.....dis 40&10 %

Saws.
Disston's Circular....dis 45@45&5 %} Extras some-
Disston's Cross Cuts d'o 45@45&5 %} times given by
Disston's Hand.....dis 25@25&5 %} jobbers.
Atkins' Circular.....dis 50 %
Atkins' Silver Steel Diamond X Cuts.....₩ foot 70¢
Atkins' Special Steel Dexter X Cuts.....₩ foot 50¢
Atkins' Special Steel Diamond X Cuts.....₩ foot 30¢
Atkins' Champion and Electric Tooth X Cuts.....₩ foot 27 @ 28¢
Atkins' Hollow Back X Cuts.....₩ foot 18¢
Atkins' Shingle, Mulay, Drag, &c.....dis 45 %
W. M. & C., Hand.....dis 30&5 @ 30&10 %
W. M. & C. Champion X Cuts, Regular ₩ foot 24¢@26¢
W. M. & C. X Cuts, Thin Back.....₩ foot 27¢@29¢
Peace Circular and Mill.....dis 45&10 %
Peace Hand Panel and Rip...dis 20&10 @ 20&10&10 %
Peace Cross Cuts, Standard.....₩ foot 25¢
Peace Cross Cuts, Thin Back.....₩ foot 27¢@28¢
Richardson's Circular and Mill.....dis 45 @ 45&10 %
Richardson's X-Cuts, No. 1, 26¢; No. 2, 27¢; No. 3, 24¢
Hack Saws—
Griffin's Hack Saws, complete.....dis 40&10 @ 50 %
Griffin's Hack Saw, Blades only.....dis 40&10 @ 50 %
Star Hack Saws and Blades.....dis 25 %
Diamond Hack Saws and Blades.....dis 25 %
Eureka and Crescent.....dis 25 %

Saw Frames.
White Vermont.....₩ gro $9 @ $10
Red, Polished, and Varnished....₩ dos $1.50, dis 25 %

Saw Sets.
Stillman's Genuine....₩ dos $5.00 and $7.75, dis 40&5 %
Stillman's Imita..₩ dos $3.25 and $5.25..dis 40&5@40&10 %
Common Lever.....₩ dos $2.00, dis 40&5 %
Morrill's No. 1, $15.00; Nos. 3 & 4, $24....dis 40&10@50%
Leach's.....No. 0, $8.00; No. 1, $15.00, dis 15 @ 20 %
Nash's.....dis 20&10 @ 20&10&10 %
Hammer, Hotchkiss.....$5.50, dis 10 %
Hammer, Bemis & Call Co.'s new Patent....dis 30&5 %
Bemis & Call Co.'s Lever and Spring Hammer..dis 30&5 %
Bemis & Call Co.'s Plate.....dis 10 %
Bemis & Call Co.'s Cross Cut.....dis 12½ %
Aiken's Genuine.....$13.00, dis 50&10 %
Aiken's Imitation.....$7.00, dis 50&5 %
Hart's Patent Lever.....dis 20 %
Disston's, Star, $9. No. 15, $5.50, dis 20&10@20&10&10 %
Atkins' Lever.....per doz No. 1, $6.00; No. 2, $9.60
Atkins' Criterion.....per doz $7.50
Croissant (Keller), No. 1, $15.00, No. 2, $24.00, dis 33⅓&10 %

Saw Tools.
Atkins Perfection....$15.00; Excelsior $6.00 ₩ doz

Scales.
Hatch, Counter, No. 171, good quality.....₩ doz $21
Hatch, Tea, No. 161.....₩ doz $6.75 @ $7.00
Union Platform, Plain.....$2.30 @ 2.35
Union Platform, Striped.....$2.40 @ 2.50
Chatillon's Grocers' Trip Scales.....dis 50 %
Chatillon's Eureka.....dis 25 %
Chatillon's Favorite.....dis 40 %
Family, Turnbull's.....dis 30@30&10 %

Scale Beams.
Scale Beams, List of Jan. 12, 82..dis 50&10@50&10&5 %
Scale Beams, Custer.....dis 30@33⅓ %
Chatillon's No. 1.....dis 40 %
Chatillon's No. 2.....dis 50 %

Scrapers.
Adjustable Box Scraper (S. R. & L. Co.)..$6.50, dis 30&10 %
Box, 1 Handle.....₩ doz $4.00, dis 10 %
Box, 2 Handle.....₩ doz $6.00, dis 10 %
Defiance Box and Ship.....dis 20&10 %
Foot.....dis 50&10@60 %
Ship, Common.....₩ doz $3.50 net
Ship, Providence Tool Co.....dis 10 %

Screen Window and Door Frames.
Porter's Pat. Window and Door Frame...dis 33⅓&10 %
Screen Corner Irons, Warner's....dis 33⅓ @ 33⅓&10 %
Stearns' Frames and Corners.....dis 25 @ 25&10 %

Screw Drivers.
Douglas Mfg Co.....dis 30&10&10 %
Disston's.....dis 45&10 %
Disston's Patent Excelsior.....dis 45&10 %
Buck Bros.....dis 30 %
Stanley R. & L. Co.'s Varnished Handles....dis 65&10 %
Stanley R. & L. Co.'s Black Handles.....dis 60&10 %
Sargent & Co.'s No. 1 Forged Blade....dis 70&10&10 %
Sargent & Co.'s No. 20.....dis 66⅔&10&10 %
Sargent & Co.'s Nos. 40 & 30, Cast Steel....dis 60&10 %
Sargent & Co.'s No. 60, Round Blade.....dis 70&10 %
Knapp & Cowles' No. 1.....dis 50&20 @ 70 %
Knapp & Cowles' No. 1 Extra.....dis 60 @ 60&10 %
Knapp & Cowles' No. 00 & 4.....dis 50&5 @ 50&10&5 %
Stearns'.....dis 25&10&5 %
Gay & Parsons.....dis 35 %
Champion.....dis 25 %
Clark's Patent.....dis 30 @ 33⅓ %
Crawford's Adjustable.....dis 30 %
Ellrich's Socket and Ratchet.....dis 25 @ 25&10 %
Allard's Spiral, new list.....dis 25 %
Kolb's Common Sense.....₩ doz $6, dis 25&10

Syracuse Screw-Driver Bits.....dis 30 & 30&5 %
Screw Driver Bits.....₩ doz, 50¢ @ 75¢
Screw Driver Bits, Parr's.....₩ gro. 6.25
Fray's Hol. Hdle. Sets, No. 3, $12.....dis. 25 @ 25 & 10 %
P. D. & Co.'s, all Steel.....dis 50 %

Screws

Wood Screws—List, Brass, Jan 27; Iron, July 1, 1887
Flat Head Iron.....dis 70 %
Round Head Iron.....dis 65 %
Flat Head Brass.....dis 65 %
Round Head Brass.....dis 60 %
Flat Head Bronze.....dis 65 %
Round Head Bronze.....dis 60 %
} Ex. 10 % often given by jobbers.

Machine—
Flat Head, Iron.....dis 55 %
Round Head, Iron.....dis 50 %

Bench and Hand—
Bench, Iron.....dis 55&10 @ 55&10&10 %
Bench, Wood, Beech.....₩ dos $2.25
Bench, Wood, Hickory.....dis 20&10 %
Hand, Wood.....dis 25&10 @ 25&10&5 %

Lag, Blunt Point.....dis 75 @ 75&10 %
Coach and Lag, Gimlet Point.....dis 75 %
Bed.....dis 25&5 %
Hand Rail, Sargent's.....dis 60&10 %
Hand Rail, Hunnason, Beckley & Co.'s..dis 70&10@75 %
Hand Rail, Am. Screw Co.....dis 75 %
Jack Screws, Millers Falls list.....dis 50 @ 50&5 %
Jack Screws, P. S. & W.....dis 35 %
Jack Screws, Sargent.....dis 60&10 @ 60&10&5 %
Jack Screws, Stearns'.....dis 40 @ 40&10 %

Scroll Saws.

Lester, complete, $10.00.....dis 25 %
Rogers, complete, $4.00.....dis 25 %

Scythe Snaths.....dis 50&10 %

Shears.

American (Cast) Iron.....dis 75&10 @ 75&10&5 %
Pruning.....See Pruning Hooks and Shears
Barnard's Lamp Trimmers.....₩ dos $3.75
Tinners'.....dis 20&2 %
Seymour's, List, Dec..1881 dis 60&10&10@60&10&10&5 %
Heinsch's, List, Dec..1881..dis 60&10&10@60&10&10&5 %
Heinsch's Tailor's Shears.....dis 33⅓ %
First quality C. S. Trimmers.....dis 80@80&10 %
Second quality C. S. Trimmers..dis 80&10@80&10&10 %
Acme Cast Shears.....dis 10&10 %
Diamond Cast Shears.....dis 10 %
Clipper.....dis 10&10 %
Victor Cast Shears.....dis 75&10@75&10&5 %
Howe Bros. & Hulbert, Solid Forged Steel.....dis 40 %
Cleveland Machine Co., Solid Steel Forged.....dis 70 %
Clauss Shear Co., Japanned.....dis 70 %
Clauss Shear Co., Nickeled, same list.....dis 60 %

Sheaves.

Sliding Door—
M. W. & Co., list Jan. 1, 1887.....dis 50&10 @ 60&5 %
R. & E., list Dec. 18, 1885.....dis 55&2 %
Corbin's list.....dis 60&10&2 %
Patent Roller.....dis 60&10&2 %
Patent Roller, Hatfield's.....dis 75 %
Russell's Anti-Friction, list Dec. 18, 1885..dis 60&2 %
Moore's Anti-Friction.....dis 60 %

Sliding Sawtter—
R. & E. list Dec. 18, 1885.....dis 60&10&2 %
Sargent's list.....dis 60&10 %
Reading list.....dis 60&10&10 %

Ship Tools.

L. & I. J. White.....dis 20&5 %
Albertson Mfg. Co.....dis 25 %

Shoes, Horse, Mule, &c.

Horse—
Burden's, Perkins', Phoenix, at factory.....$4.00

Mule—Add $1 ₩ keg to above prices.

Ox, Wrought—
Ton lots.....₩ ₵ 9¢
1000 ₵ lots.....₩ ₵ 9½¢
500 ₵ lots.....₩ ₵ 10¢

Shot.—(*Eastern prices, 2¢ off, cash, 5 days.*)

Drop, ₩ bag, 25 ₵.....$1.25
Drop, ₩ bag, 5 ₵.....30
Buck and Chilled, ₩ 25-₵ bag.....$1.50
Buck and Chilled, ₩ 5-₵ bag.....35

Shovels and Spades.

Ames' Shovels, Spades, &c., list Nov. 1, 1885.....dis 20 %
NOTE.—Jobbers frequently give 5 @ 7½ % extra on above.
Griffith's Black Iron.....dis 50&10 %
Griffith's C. S.....dis 60 @ 60&10 %
Griffith's Solid Cast Steel R. R. Goods.....dis 20 %
Old Colony (Sanford Fork & Tool Co).....dis 20 %
St. Louis Shovel Co.....dis 15 @ 15&7½ %
Hussey, Binns & Co.....dis 15 @ 25 %
Hubbard & Co.....dis 20@20&7½ %
Lehigh Mfg. Co.....dis 50&10 %
Payne Pettebone & Son, list January, 1886.....dis 30 %
Remington's (Lowman's Patent).....dis 30&10 @ 40 %
Rowland's, Black Iron.....dis 50&10 %
Rowland's Steel.....dis 60&5 @ 60&10 %

Shovels and Tongs.

Iron Head.....dis 60&10@60&10&5 %
Brass Head.....dis 60&10&10 %

Skeins, Thimble.

Western list.....dis 75&5 @ 75&10 %
Columbus Wrt. Steel, list Nov. 1, 1887.....dis 20 %
Coldbrookdale Iron Co.....dis 50&10 %
Utica P. S. T. Skeins.....dis 60 %
Utica Turned and Fitted.....dis 35 %

Sieves.

Buffalo Metallic, S. S. & Co., new list..dis 50&25&10 %
Barler Flour Sifters.....₩ doz $2.00
Smith's Adjustable Sifters.....₩ doz $2.25
Smith's Adjustable Milk Strainer.....₩ doz $2.00
Smith's Adjustable F. & C. Strainer.....₩ doz $1.75

Sieves, Wooden Rim—	Iron.	Plated.
Mesh 18, Nested. ₩ doz.	70¢	90¢
Mesh 20, Nested. ₩ doz.	85¢	$1.00
Mesh 24, Nested. ₩ doz.	$1.00	1.10

Slates.—School, by case.....dis 50&10 %

Snaps, Harness, &c.

Anchor (T. & S. Mfg Co.).....dis 66 %
Fitch's (Bristol).....dis 50&10 %
Hotchkiss.....dis 10 %
Andrews.....dis 50 %
Sargent's Patent Guarded.....dis 70&10&10 %
German, new list.....dis 40&10 %
Covert.....dis 50&2 %
Covert, New Patent.....dis 50&5&2 %
Covert New R. E.....dis 60&2 %
Covered Spring.....dis 60&10&10 %

Soldering Irons.

Covert's Adjustable. list Jan. 1, 1886.....dis 35&2 %

Spoke Shaves.—Iron.....dis 45 %
Wood.....dis 30 %
Bailey's (Stanley R. & L. Co.).....dis 40&10 %
Stearns'.....dis 20&10 @ 30 %

Spoke Trimmers.

Bonney's.....₩ dos $10.00, dis 50 %
Stearns'.....dis 20&10 %
Ives'.....No. 1, $15.00; No. 2, $12.00 ₩ dos, dis 55&10 %
Douglass'.....₩ dos $9.00, dis 20 %

Spoons and Forks.

Tinned Iron—
Basting, Central Stamping Co.'s list. dis 70@70&10 %
Solid Table and Tea, Central Stamping Company's list.....dis 70@70&10 %
Buffalo, S. S. & Co.....dis 33⅓&2 %

Silver-Plated—4 mos. or 5 % cash 30 days.
Meriden Brit. Co., Rogers.....dis 50 %
C. Rogers & Bros.....dis 50 %
Rogers & Bro.....50 %
Reed & Barton.....dis 50 %
Wm. Rogers Mfg. Co.....dis 50 @ 50&10 %
Simpson, Hall, Miller & Co.....dis 50 @ 50&10 %
Holmes & Edwards Silver Co.....dis 50 @ 50&10 %
H. & E. Silver Co. Mexican Silver.....dis 50&5 %
H. & E. Silver Co., Durham Silver.....dis 50&5 %
German Silver.....dis 50 @ 50&5 %
German Silver, Hall & Elton.....dis 40&5 %
Nickel Silver.....dis 50&5@50&10&5 %, cash
Britannia.....dis 55 %
Boardman's Flat Ware.....dis 50&10 %
Boardman's Nickel Silver.....dis 40&10 %
Boardman's Brit'nia Spoons, case lots..dis 50&10 %
} 4 mos.

Springs.

Elliptic, Concord, Platform and Half Scroll.....dis 60 @ 60&5 %
Cliff's Bolster Springs.....dis 25 %

Squares.

Steel and Iron.....
Nickel-Plated.....
} dis 70 @ 75&5 %

Try Square and T Bevels.....dis 60&10&10 @ 70 %
Disston's Try Square and T Bevels.....dis 45&10 %
Winterbottom's Try and Miter.....dis 30&10 %

Staples.

Fence Staples, Galvanized } Same price as Barb Wire.
Fence Staples, Plain..... } See Trade Report.

Steelyards.....dis 40&10@50&5 %

Stocks and Dies.

Blacksmith's, Waterford Goods....dis 30&5 @ 30&10 %
Lightning Screw Plate.....dis 25 @ 30 %
Reece's New Screw Plates.....dis 33⅓&5 @ 33⅓&5 %

Stone.

Hindostan No. 1, 3¢; Axe, 5½¢; Slips No. 1, 5¢.
Sand Stone.....₩ ₵..1
Washita Stone, Extra.....₩ ₵..1 @ 22¢
Washita Stone, No. 1.....₩ ₵..15 @ 16¢
Washita Stone, No. 2.....₩ ₵..11 @ 12¢
Washita Slips, No. 1. Extra.....₩ ₵..40 @ 42¢
Washita Slips, No. 1.....₩ ₵..30 @ 32¢
Arkansas Stone. No. 1, 4 to 6 in.....₩ ₵..$1.35
Arkansas Stone. No. 1, 6 to 9 in.....₩ ₵..$1.75
Turkey Oil Stone.....4 to 8 in., ₩ ₵..40¢
Turkey Slips.....₩ ₵..$1.00 @ $1.50
Lake Superior, Chase.....₩ ₵..10¢
Lake Superior Slips, Chase.....₩ ₵..31@32¢
Seneca Stone, Red Paper Brand, ₩ ₵.....18 @ 20¢
Seneca Stone, High Rounds, ₩ ₵.....20 @ 25¢
Seneca Stone, Small Wheels, ₩ gro.....$24.00

Stove Polish.

Joseph Dixon's.....₩ gro $6.00, dis 10 %
Gem.....₩ gro $4.50, dis 10 %
Gold Medal.....₩ gro $6.00, dis 25 %
"Mirror".....₩ gro $6.00, dis — %
Lustro.....₩ gro $4.75 net
Ruby.....₩ gro $3.75 net
Rising Sun, 5 gro. lots.....₩ gro $5.50
Dixon's Plumbago.....₩ ₵ 8¢ net
Boynton's Noon Day, ₩ gro.....$5.00
Parlor Pride Stove Enamel.....₩ gross, $13
Yates' Liquid, 2 3 5 10 gal. cans
₩ gal... $0.90 .80 .70 .60
Yates Standard Paste Polish, 10-lb cans, per lb., 15 ¢
Jet Black.....₩ gro $3.50
Japanese.....₩ gro $3.50
Fireside.....₩ gro $2.50
Diamond O. K. Enamel.....₩ gro $19.00

Tacks, Brads, &c.

List Jan. 2, 1888.

American Iron Carpet Tacks.....dis 72½&10&2 %
Steel Carpet Tacks.....dis 72½&10&2 %
Swedes Iron Carpet Tacks.....dis 72½&10&2 %
American Iron Cut Tacks.....dis 70&10&2 %
Swedes Iron Tacks.....dis 67½&10&2 %
Swedes Iron Upholsterers' Tacks...dis 67½&10&2 %
Tinned Swedes Iron Tacks.....dis 67½&10&2 %
Tin'd Sw'des Iron Uphol'ers'Tacks.dis 67½&10&2 %
Gimp and Lace Tacks.....dis 67½&10&2 %
Tinned Gimp and Lace Tacks.....dis 67½&10&2 %
Swedes Iron Trimmers' Tacks.....dis 67½&10&2 %
Swedes Iron Miners' Tacks.....dis 67½&10&2 %
Swedes Iron Bill Posters' or Railroad Tacks.....dis 67½&10&2 %
Swedes Steel Tacks, all kinds (Swedes Iron price list).....dis 72½&10&2 %
Copper Tacks.....dis 33⅓&10&2 %
Copper Finishing Trunk and Clout Nails.....dis 33⅓&10&2 %
Finishing Nails.....dis 60&10&2 %
Trunk and Clout Nails.....dis 60&10&2 %
Tinned Trunk and Clout Nails.....dis 60&10&2 %
Basket Nails.....dis 60&10&2 %
Common and Patent Brads.....dis 60&10&2 %
Hungarian Nails.....dis 60&10&2 %
Chair Nails.....dis 60&10&2 %
Zinc Glaizers' Points.....dis 40&10&2 %
Cigar Box Nails.....dis 45&10&2 %
Picture-Frame Points.....dis 45&10&2 %
Looking-Glass Tacks.....dis 45&10&2 %
Feathered Carpet Tacks.....dis 45&10&2 %
Brush Tacks.....dis 45&10&2 %
Shoe Finders'.....List Jan. 2, 1888. dis 10 @ 10&5 %
Lining and Saddle Nails, List Jan. 1, 1886:
Silvered.....dis 30&10&10 %
Japanned.....dis 20&10&10 %
Double-pointed Tacks.....85 %
Wire Carpet Nails.....dis 50&10 %
Wire Brads and Nails.....See Nails, Wire
Steel Wire Brads, R. & E. Mfg. Co.'s list.....dis 50&10 %

} Extra 10@10&5 % generally given.

Tap Borers.—Common and Ric....dis 20&10 %
Ives' Tap Borers.....dis 33⅓&5 %
Enterprise Mfg. Co.....dis 20&10 @ 30 %
Clark's.....dis 33⅓ @ 35 %

Tapes, Measuring.—American.....dis 25&10 %
Spring.....dis 40 %
Chesterman's.....Regular list dis 25 @ 30 %

Thermometers.—Tin Case.....dis 80 @ 80&10 %

Thimble Skeins.—See Skeins.

Ties, Bale.

Steel Wire, Standard list.....dis 50&10&5 %

Tinners' Shears, &c.

Shears and Snips (P. S. & W.).....dis 20 @ 25 %
Punches—See Punches.
Snips, J. Mallinson & Co.....dis 33⅓ %

Tinware.

Stamped, Japanned & Pieced, list Jan. 20, 18..
.....dis 7C @ 70&10&5 %

Tire Benders, Upsetters, &c.

Stoddard's Lightning Tire Upsetters.....dis 15 %
Detroit Perfected Tire Bender.....dis 15 %

Tobacco Cutters.

Enterprise Mfg. Co. (Champion).....dis 20&10 @ 30 %
Wood Bottom.....₩ dos $5.00 @ $5.25
All Iron.....₩ doz $4.25
Nashua Lock Co.'s.....₩ dos $18.00, dis 50 @ 55 %
Wilson's.....dis 55 %
Clipper (Sargent & Co.).....₩ dos $24, dis 50&10&10 %
Acme.....₩ dos $20.00, dis 40 %

'Transom Lifters

Wollensak's Patent Iron Bronzed.....dis 50 %
Reiher's bronzed Iron Rods list Jan. 1, 1887.dis 50&2 %
Reiher's Real Bronze or Nickel Plate. list Jan. 1, 1887.....dis 50&2 %
Excelsior.....dis 50&10&2 %
Shaw's.....dis 50&10 %
Payson's Universal.....dis 40 @ 40&10 %
Crown and Star.....dis 50 %

Traps.

Game—
Newhouse.....dis 35 @ 40&5 %
Oneida Pattern.....dis 60&10&10 @ 70 %
Game, Blake's Patent.....dis 40&10&5 %

Mouse and Rat.—
Mouse, Wood, Choker.....₩ doz holes, 11@12¢
Mouse, Round Wire.....₩ doz $1.50, dis 10 %
Mouse, Cage, Wire.....₩ doz $2.50, dis 10 %
Mouse, Catch-'em-alive.....₩ doz $2.50, dis 15 %
Mouse, "Bonanza".....₩ gross $10 net
Mouse, Delusion.....₩ gross $18.00, dis 15 %
Rat, "Decoy".....₩ gross $10.00, dis 10 %
Ideal.....₩ gross $10
Cyclone.....₩ gross $5.25
Hotchkiss Metallic Mouse, 5 hole traps....₩ doz 90¢
In full cases.....₩ doz 75¢

Trowels.

Lothrop's Brick and Plastering.....dis 2[illegible] %
Reed's Brick and Plastering.....dis 15 %
Disston's Brick and Plastering.....dis 25 @ 25&10 %
Peace's Plastering.....dis 25 %
Clement & Maynard's.....dis 20 %
Rose's Brick.....dis 15 @ 20 %
Brade's Brick.....dis 25 %
Worrall's Brick and Plastering.....dis 2[illegible] %
Garden.....dis 70 %

Triers.—Butter and Cheese.....dis 25 %

Trucks, Warehouse, &c.

B. & L. Block Co.'s list, 1882.....dis 40 %

Tubes, Boiler.—See Pipe

Twine.

	BC.	B.
No. 9, Flax Twine, ¼ and ½ ₵ Balls	22¢	30¢
No. 12, " " ¼ and ½ "	21¢	29¢
No. 18, " " ¼ and ½ "	18¢	28¢
No. 24, " " ¼ and ½ "	18¢	28¢
No. 36, " " ¼ and ½ "	16¢	27¢
No. 264, Mattrass, ¼ and ½ "		48 @ 50¢
Chalk Line, Cotton, ¼ ₵ Balls		25¢
Mason Line, Linen, ¼ "		55¢
2-Ply Hemp, ¼ and ½ ₵ Balls (Spring Twine)		11½¢
3-Ply Hemp, 1 ₵ Balls		12 @ 12½¢
3-Ply Hemp, 1¼ ₵ Balls		11 @ 11½¢
Cotton Wrapping, 5 Balls to ₵		15¢ @ 16¢
2, 3, 4 and 5 Ply Jute, ¼ ₵ Balls		10¢
Wool		6½¢ @ 6¾¢
Paper		13¢ @ 14¢
Cotton Mops—6, 9, 12 and 15 ₵ to doz.		18¢

Vises.

Solid Box.....dis 30&10&5 @ 60 %

Parallel—
Fisher & Norris Double Screw.....dis 15&10 %
Stephens'.....dis 25 @ 30 %
Parker's.....dis 20 @ 25 %
Wilson's.....dis 55 %
Howard's.....dis 40 %
Bonney's.....dis 40&10 %
Millers Falls.....dis 40 @ 40&10 %
Trenton.....dis 40&5 @ 40&10 %
Merrill's.....dis 15@20 %
Sargent's.....dis 60&10&10 %
Backus and Union.....dis 40 %
Double Screw Leg.....dis 15&10 %
Prentiss.....dis 20&5 @ 25 %
Simpson's Adjustable.....dis 40 %

Saw Filers—
Bonney's. Nos. 2 & 3.....₩ dos $15.00, dis 40 &10 %
Stearn's.....dis 33⅓&10 @ 33⅓&10&10 %
Stearn's Silent Saw Vises.....dis 33⅓ @ 35 %
Sargent's.....dis 60&10&10 %
Hopkins'.....₩ dos $17.50, dis 10 %
Reading.....dis 40&10 %
Wentworth.....dis 20&10 %
Combination Hand Vise.....₩ gro, $42.00
Cowell Hand Vises.....dis 20 %
Bauer's Pipe Vises.....dis 10 %

Wagon Boxes.

Per lb.....3½¢

Washer Cutters.

Smith's Patent.....₩ dos $12.00, dis 40&10&10 %
Johnson's.....₩ dos $11.00, dis 33⅓ %
Penny's.....₩ dos Pol. $14; Jap'd. $16..dis 55 %
Appleton's.....₩ dos $16.00, dis 60&10 %
Bonney's.....dis 30&10 %

Washers.

Size	¼	5-16	⅜	½	⅝	¾	1
Washers	7	5⅝	4¾	3⅜	2½	3½	3⅛

In lots less than 200 ₵, ₩ ₵, add 1½¢, 5-₵ boxes 1¢ to list.

Wedges.—Iron.....₩ ₵ 3½¢
Steel.....₩ ₵ 4¢

Well Buckets, Galvanized.

Hill's.....₩ doz..12 qt., $4.25; 14 qt., $5.25
Iron Clad.....₩ doz., 14 qt., $4.25 @ $4.50
Whiting's Flat Iron Band.....₩ dos $4.25 @ $4.50
Whiting's Wired Top.....₩ dos $4.00 @ $4.25

Well Wheels—8 in., $2.25; 10 in., $2.70; 12 in., $3.25.

Wire.

Iron—
Market, Br. & Ann., Nos. 0 to 18.....dis 75@75&5 %
Market, Coppered, Nos. 0 to 18.....dis 70@70&10 %
Market, Galvanized, Nos. 0 to 18.....dis 65&10 %
Market, Tin'd, Tinned list Nos. 0 to 18.....dis 67½@67½&5 %
Stone Br. & Ann'd, Nos. 16 to 18.....dis 72½&5@75 %
Stone, Bright & Ann'd, Nos. 19 to 26..dis 75&5@75&10 %
Stone, Br. & Ann'd, Nos. 27 to 36...dis 75&10&5@80 %
Stone, Tin'd, Tin'd list, Nos. 18 to 36..dis 70&10@75 %
Tinned Broom Wire, Nos. 13 to 24.....dis 72½@75 %
Galvanized Fence.....dis 65@65&5 %
Annealed Fence, Nos. 8 & 9.....dis 75@75&5 %
Annealed Grape, Nos. 10 to 14.....dis 75@75&5 %
Brass and Copper, list, Jan. 13, '84.....dis 15 @ 20 %
Barb Fence.....See Trade Report
Wire on Spools.....dis 65 %
Malin's Steel and Tinned Wire on Spools.....dis 50 %
Malin's Brass and Copper Wire on Spools.....dis 40 %
Cast Steel Wire.....dis 50 %
Scribe' Steel Wire.....$6.00 to $8, dis 30 %
Steel Music Wire, Nos. 12 to 30.....55¢ ₩ ₵
Picture Wire.....dis 60&10 %
Barb Wire Safety Guards.....₩ 1000 $6.00, dis 35 %
Wire Clothes Lines. See Lines.

Wire Cloth, Netting, &c.

Painted Screen Cloth, No. 34, ₩ 100 sq ft.....$1.90
Painted Screen Cloth, No. 33, ₩ 100 sq. ft.....$2.00
Galvanized Wire Netting.....dis 70&10 @ 75 %

Wire Goods.—See Bright Wire Goods.

Wire Rope.—List May 1, 1886.....dis 33⅓ %

Wrenches.—American Adjustable.....dis 45 %
Baxter's Adjustable "S".....dis 40&10 @ 50 %
Baxter's Diagonal.....dis 40&10 @ 50 %
Coes' Genuine.....dis 55&3 %
Coes' "Mechanics".....dis 55&10&3 %
Girard Standard.....dis 70&10 %
Lamson & Sessions' Engineers'.....dis 60&10 %
Lamson & Sessions' Standard.....dis 70&10 %
Coes' Pattern, Wrought.....
Girard Agricultural.....
Lamson & Sessions' Agricultural.....
Sterling Wrought.....
} dis 80 @ 80&5 %

Bemis & Call's Patent Combination.....dis 35 %
Bemis & Call's Merrick's Pattern.....dis 35 %
Bemis & Call's Brigg's Patte[illegible].....dis 25 %
Bemis & Call's Cylinder or Gas Pipe.....dis 40&5 %
Remis & Call's No. 3 Pipe.....dis 35&5 %
Aiken's Pocket (Bright).....$6.00, dis 50&10 %
The Favorite Pocket (Bright).....₩ dos $4.00, dis 40 %
Webster's Patent Combination.....dis 35 %
Boardman's.....dis 2[illegible] @ 25 %
Always Ready.....dis 25&5 %
Alligator.....dis 50 %
Donohue's Engineer.....dis 25 %
Acme, Bright.....dis 60&3 %
Acme, Nickeled.....dis 50&3 %
Walker's.....dis 55&3 %
Diamond.....dis 40 %
Diamond Patent Steel.....dis 40 %

Wringers, Clothes.

List Jan. 10, 1888, $5.00 off.

Wrought Goods.

Staples Hooks, &c., is Jan. 12, '87, dis 80&20@10&5 25 %

CURRENT METAL PRICES.

JULY 3, 1888.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron:
¾ to 2 in. round and square.. 1 to 6 in. x ¾ to 1 in. ₩ lb 1.90 @ 2.00¢
Refined Iron:
¾ to 2 in. round and square.. 1 to 4 in. x ¾ to 1½ in. 4½ to 6 in. x ¾ to 1 in. ₩ lb 2.10 @ 2.25¢
1 to 6 in. x ¼ and 5-16 ₩ lb 2.30 @ 2.45¢
Rods—⅝ and 11-16 round and sq. ₩ lb 2.30 @ 2.35¢
Bands—1 to 6 x 3-16 to No. 12. ₩ lb 2.30 @ 2.45¢
"Burden Best" Iron, base price. ₩ lb 3.00 @ ... ¢
Burden's "H. B. & S." Iron, base price ₩ lb 2.80 @ ... ¢
"Ulster" ₩ lb 3.10 @ ... ¢
Norway Rods 4.00 @ 5.00¢

Merchant Steel from Store.

Per pound.

Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots 2¾¢ @ 3¢
Best Cast Steel, base price in small lots 9¢ @ 10¢
Best Cast Steel Machinery, base price in small lots 5½¢ @ 6¢

For Classification and Extras adopted by the Merchant Steel Association of the United States, June 1, 1888, see *The Iron Age*, June 21, 1888.

Sheet Iron from Store.

	Common American.		R. G.	Cleaned.
10 to 16	₩ lb 2.75	@ 2.80¢	3.25	@ ... ¢
17 to 20	₩ lb 2.85	@ 3.00¢	3.25	@ 3.50 ¢
21 to 24	₩ lb 3.00	@ 3.10¢	3.50	@ ... ¢
25 and 26	₩ lb 3.20	@ ...	3.50	@ ... ¢
27	₩ lb 3.35	@ 3.37½¢	3.75	@ ... ¢
28	₩ lb 3.50	@ ... ¢	4.00	@ ... ¢

	B. B.	2d qual.
Galv'd, 14 to 20, ₩ lb.	4.50 @ ...	4.38 @ ... ¢
Galv'd, 21 to 24, ₩ lb.	4.87½ @ ...	4.75 @ ... ¢
Galv'd, 25 to 26, ₩ lb.	5.25 @ ...	5.12 @ ... ¢
Galv'd, 27	₩ lb. 5.62½ @ ...	5.48 @ ... ¢
Galv'd, 28	₩ lb. 6.00 @ ...	5.85 @ ... ¢
Patent Planished	₩ lb A 10¢	B, 9¢
Russia	₩ lb 9½¢ @ 10¢	
American Cold Rolled B. B.	₩ lb 5¢ @ 7¢	

English Steel from Store.

Best Cast ₩ lb 15 ¢
Extra Cast ₩ lb 16½ @ 17 ¢
Swaged, Cast ₩ lb 16 ¢
Best Double Shear ₩ lb 15 ¢
Blister, 1st quality ₩ lb 12½¢
German Steel, Best ₩ lb 10 ¢
2d quality ₩ lb 9 ¢
3d quality ₩ lb 8 ¢
Sheet Cast Steel, 1st quality ₩ lb 15 ¢
2d quality ₩ lb 14 ¢
3d quality ₩ lb 12½¢

METALS.

Tin.

Per lb

Banca, Pigs 24¢
Straits, Pigs 20¢
English, Pigs 23¢
Straits in Bars 22¢

Tin Plates.

Charcoal Plates.—Bright. Per box.

Melyn Grade	IC, 10 x 14	$6.25
" "	IC, 12 x 12	6.50
" "	IC, 14 x 20	6.25
" "	IC, 20 x 28	12.75
" "	IX, 10 x 14	7.75
" "	IX, 12 x 12	8.00
" "	IX, 14 x 20	7.75
" "	IX, 20 x 28	15.75
" "	DC, 12½ x 17	5.75
" "	DX, 12½ x 17	7.25
Calland Grade	IC, 10 x 14	6.00
" "	IC, 12 x 12	6.25
" "	IC, 14 x 20	6.00
" "	IX, 10 x 14	7.50
" "	IX, 12 x 12	7.75
" "	IX, 14 x 20	7.50
Allaway Grade	IC, 10 x 14	$5.25 @ ...
" "	IC, 12 x 12	5.50 @ ...
" "	IC, 14 x 20	5.25 @ ...
" "	IC, 20 x 28	10.75 @ ...
" "	IX, 10 x 14	6.25 @ ...
" "	IX, 12 x 12	6.50 @ ...
" "	IX, 14 x 20	6.25 @ ...
" "	IX, 20 x 28	12.50
" "	DC, 12½ x 17	5.00 @ ...
" "	DX, 12½ x 17	6.00 @ ...

Coke Plates—Bright.

Steel Coke.—IC, 10 x 14, 14 x 20		$4.80 @ ...
	10 x 20	7.50 @ 7.65
	20 x 28	10.00 @ 10.15
	IX, 10 x 14, 14 x 20	5.65
BV Grade.—IC, 10 x 14, 14 x 20		4.70 @ ...

Charcoal Plates.—Terne.

Dean Grade.—IC, 14 x 20		$4.62½ @ ...
	20 x 28	9 25 @ ...
	IX, 14 x 20	5.62½ @ ...
	20 x 28	11.37½ @ ...
Abecarne Grade.—IC, 14 x 20		4.50 @ ...
	20 x 28	9.00 @ ...
	IX, 14 x 20	5.50 @ ...
	20 x 28	10.80

Tin Boiler Plates.

IXX, 14 x 26	112 sheets.	$12.50 @ $12.75
IXX, 14 x 28	112 sheets	12 75 @ ...
IXX, 14 x 31	112 sheets	14.25 @ ...

Copper.

Duty: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ ₩ lb. Manufactured (including all articles of which Copper is a component of chief value), 45 % ad valorem.

Ingot.

Lake 17¢ @ 17.50¢
"Anchor" Brand 16.50¢ @ 17¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, December 10, 1887.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound. Over 61 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		25	25	25	26	27	28	31	33
30		72	25	25	25	26	28	30	34	...
36	96		25	25	25	27	29	33	36	....
36		96	25	25	26	28	30	34	38	....
48	96		25	25	27	29	31	35	....	....
48		96	25	25	28	30	32	36	....	....
60	96		25	25	30	32	37	....	....	....
60		96	25	26	31	....	....	....	....	....
84	96		26	27	...	....	....	....	....	....
84		96	27	28	...	....	....	....	....	....
Over 84 in. wide			28	30	...	....	....	....	....	....

All Bath Tub Sheets	16 oz.	14 oz.	12 oz.	10 oz.
Per pound	$0.28	0.30	0.32	0 35

Bolt Copper, ⅝ inch diameter and over, per pound 25¢
Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Circles over 60 inches diameter, up to 96 inches diameter, inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.
Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.
Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

Copper Bottoms, Pits and Flats.

Per pound.

14 ounce to square foot and heavier 28¢
12 ounce and up to 14 ounce to square foot 29¢
10 ounce and up to 12 ounce 31¢
Circles less than 8 inches diameter 2 cents per pound additional.
Circles over 13 inches diameter are not classed as Copper Bottoms.

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each 8¢
Tinning sheets on one side, 30 x 60 each 30¢
For tinning boiler sizes, 9 in (sheets 14 in. x 60 in.), each 15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each 12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.) each 12¢
Tinning sheets on one side, other sizes, per square foot 2½¢
For tinning both sides double the above prices.

Planished Copper.

Planished Copper List May 5, 1888 Net

Brand and Copper Tubes.

Seamless Copper.		Seamless Brass.	
⅜ inch	₩ lb 50¢	⅜ inch	₩ lb 47¢
½ "	" 44¢	½ "	" 41¢
⅝ "	" 42¢	⅝ "	" 39¢
¾ "	" 40¢	¾ "	" 37¢
⅞ "	" 39¢	⅞ "	" 36¢
1 "	" 37¢	1 "	" 34¢
1½ "	" 34¢	1½ "	" 31¢

Roll and Sheet Brass.

Discount from list 10 @ 15 %

Spelter.

Duty: Pig, Bars and Plates, $1.50 ₩ 100 lb.
Western Spelter 5 @ 5¼¢
"Bergenport" 8¾¢
"Bertha" 7¾ @ 8¢

Zinc.

Duty; Sheet, 2½¢ ₩ lb.
600 lb casks 6½¢
Per lb 7¢

Lead.

Duty: Pig, $2 ₩ 100 lb. Old Lead, 2¢ ₩ lb. Pipe and Sheets, 3¢ ₩ lb.
American 4¼ @ 4½¢
Newark 4¼ @ 4½¢
Bar @ 4½¢
Pipe 6½¢
Tin-Lined Pipe 15¢
Block Tin Pipes 40¢
Sheet 7½¢

Solder.

½ @ ½ (Guaranteed) 18¢
Extra Wiping 13¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson ₩ lb 13¾ @ 14¢
Hallett's " 11½¢

Plumbers' Brass Work.

	Discount per cent.
Ground Bibbs and Stops	55&10&2
Ground Stops, Hydrant Cocks, &c	55&10&2
Corporation Cocks	55&10&2
Corporation Cocks, "Mueller" Pattern, from Western list	55&10&2
Ground Basin and Shampooing Cocks	50&10&2
Compression Basin Cocks	50&10&2
Compression Basin and Sink Cocks	50&10&2
Compression Pantry Cocks	50&10&2
Compression Double Basin and Shampooing Cocks	50&10&2
Compression Double Bath Cocks	50&10&2
Compression Bibbs, Urinal Cocks, Sill Cocks, Stops, Hopper Cocks, Hydrant Cocks and Ball Cocks	50&10&2
Basin Plugs and Basin Grates	55&10&2
Bath and Wash Tray Plugs	55&10&2
Bath Wastes and Washers, Bath and Basin Valves, Sewer and Vacuum Valves, Cistern Valves, Pump Valves and Strainers, Ship Closet Valves and Suction Baskets	55&10&2
Basin Clamps, Basin Joints and Strainers	55&10&2
Boiler Couplings, Ground Face, per set $1.25	...dis 10
Boiler Couplings, Plain Face, per set $1.30	...dis 10
Water Back Valve and Plain Couplings, Soldering Nipples and Unions	55&10&2
Union Joints	60&10&2
Hydrant Nozzles, Handles and Guides, Sockets and Clamps, Street Washer Screws and Guides	55&10&2
Hose Goods	55&10&2

Steam and Gas Fitters' Brass and Iron Work.

	Discount per cent.
Brass Globe Valves	60&10&2
Finished Brass Globe Valves, with Finished Brass Wheels	40&10&2
Brass Globe Valves, with Patent Wood Wheels	60&10&2
Brass Globe Angle and Corner Valves	60&10&2
Brass Radiator Angle Valves	60&10&2
Brass Radiator Angle Valves, Frink's Patent	60&10&2
Brass Cross and Check Valves	60&10&2
Brass Check Valves	60&10&2
Brass Hose Valves	60&10&2
Brass and Iron Frink Valves	60&10&2
Brass Safety Valves	60&10&2
Brass Vacuum Valves	50&10&2
Brass Whistle Valves	60&10&2
Brass Balance, Back Pressure and Foot Valves	50&10&2
Brass Butterfly and Throttle Valves	50&10&2
Brass Pump Valves	50&10&2
Brass Steam Cocks	57½&10&2
Brass Service, Meter and Union Meter Cocks	57½&10&2
Brass Whistles, Water Gauges and Oil Cups	60&10&2
Brass Hollow Plug, Tallow and Globe Oil Cups	50&10&2
Brass Lubricators	60&10&2
Brass Air Valves	60&10&2
Brass Air Cocks	60&10&2
Brass Gauge Cocks	55&10&2
Brass Cylinder Cocks and Steam Bibbs	50&10&2
Brass Swing Joints and Expansion Joints	50&10&2
Brass Test Pumps	50&10&2
Brass Steam Fittings, Rough	60&10&2
Brass Steam Fittings, Finished	2 &10&2
Brass Union Joints	60&10&2
Brass Soldering Unions and Nipples	55&10&2
Brass Hose Fittings, Fusible and Boiler Plugs	55&10&2
Iron Body Globe, Angle, Cross and Check Valves	65&10&2
Iron Body Safety, Throttle, Back Pressure, Butterfly and Foot Valves	65&10&2
Iron Cocks, all Iron	65&10&2
All Iron Valves	65&10&2

Miscellaneous.

	Discount per cent.
Cast Iron Fittings	70&10
Plugs and Bushings	75&10
Malleable Iron Unions	67½
Malleable Iron Fittings	55

Paints.

Black, Lamp—Coach Painters'	₩ lb 22 @ 24¢
" Ordinary	6¢
Black, Ivory Drop, fair	12 @ 15¢
" best	20¢
Black Paint, in oil, kegs, 8¢; assorted cans	11¢
Blue, Prussian, fair to best	40 @ 55¢
" " in oil	45 @ 55¢
" Chinese dry	70¢
" Ultramarine	18 @ 30¢
Brown, Spanish	1¼¢
" Van Dyke	10 @ 12¢
Dryers, Patent American, ass'd cans, 9¢; kegs	7¢
Green, Chrome	15 @ 22¢
Green, Chrome in oil	14 @ 18 @ 25¢
Green, Paris	good, 20¢; best, 25¢
Green, Paris in oil	good, 30¢; best, 35¢
Iron Paint, Bright Red	₩ lb 2½¢
Iron Paint, Brown	₩ lb 1½¢
Iron Paint, Purple	₩ lb 3¢
Iron Paint, Ground in oil, Bright Red	₩ lb 6½¢
Iron Paint, Ground in oil, Red	₩ lb 5½¢
Iron Paint, Ground in oil, Brown	₩ lb 5½¢
Iron Paint, Ground, Purple	₩ lb 6¢
Litharge	6½¢
Mineral Paints	2 @ 4¢
Orange Mineral	10¢
Red Lead, American	6½¢
Red Venetian (Eng.) dry	$1.65 @ $1.70
Red Venetian in oil	ass't'd cans, 11¢; kegs, 8¢
Red Indian Dry	9 @ 12¢
Rose Pink	10 @ ¢